

# THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED  
THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER  
**ELECTRO-PLATERS REVIEW**

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## Paul Revere's Copper Work

**A History of Paul Revere as the American Pioneer in Copper Rolling. His Great-Grandson is Now President of the Lineal Descendant of the Original Company.\***

For his dramatic participation in the patriotic efforts that gave birth to this Nation's independence Paul Revere justly holds an illustrious place in American history. But there are few who know that he also holds a high place in the history of American industry.

His silverware, well known to those appreciative of beauty of design, is much sought today. Some may have heard that he was a skilled engraver. But it will be surprising news to many who are even today in the same industry, to know that he was the pioneer in the rolling of copper on this continent, building a large and successful business whose products were applied to many structures famous in the annals of the young Republic.

In 1788 Paul Revere branched out from his occupation as a gold and silver-smith and established an iron foundry, where he cast cannon and ironware. Subsequently he added non-ferrous metals. In 1792 his first church bell was cast, and before many years had passed few New England churches did not summon their worshippers with bells cast in Revere's foundry.

Conspicuous and historical was his work in the non-ferrous metals. Among the products from his plant were copper and bronze fittings for ships, including materials for the famous fighting frigate "Constitution," affectionately dubbed "Old Ironsides."

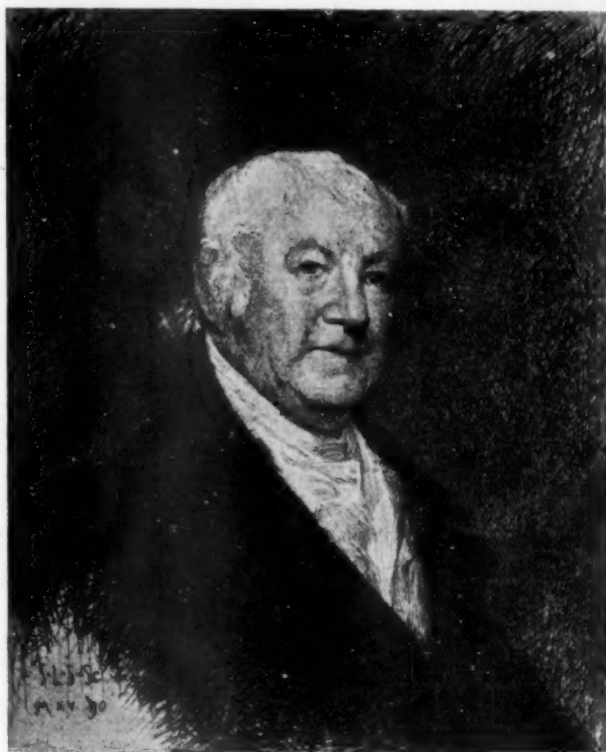
The metal work in Old Ironsides was typical of the highest grade of marine metal products. Rear Admiral Philip Andrews, U. S. N., chairman of the "Save Old Ironsides" movement, has favored us with the photographs of the copper parts.

Copper bolts were  $\frac{3}{4}$  inch in diameter and approximately 14 inches long. They were used below water line to fasten timbers. Small copper nails were used for fastening the copper sheeting to the wooden hull.

The Save Old Ironsides Committee is selling, among other souvenirs, copper book ends, cast from the copper sheeting removed from the original hull of the Constitution, and filled with lead from the lining of the magazines.

In his foundry Revere laid the foundation for his practical experience in melting and working non-ferrous metals. His interest in the subject was intense, and he applied to it his characteristic tenacity and thoroughness. That he had confidence in himself and his methods is evidenced by this excerpt from a letter he wrote on July 4, 1799, to Jacob Sheafe, U. S. Naval Agent at Portsmouth, N. H.: "No man but myself in the four New England States can melt the Copper and draw it into Spikes."

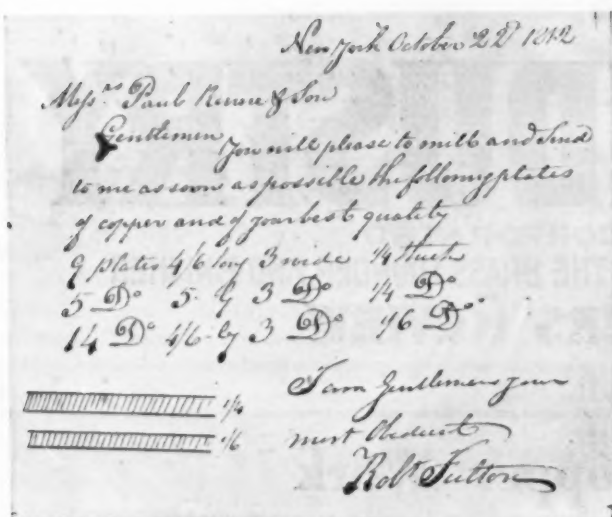
On February 26, 1800, he wrote the following to Benjamin Stoddard, Secretary of the Navy: "I learned of that gentleman (Colonel Humphries) that there are no persons in either Philadelphia or New York who can make Copper so that it can be drawn in Bolts, Spikes, etc., under the hammer."



ETCHING BY SIDNEY L. SMITH FROM PAINTING BY GILBERT STUART

*Paul Revere*

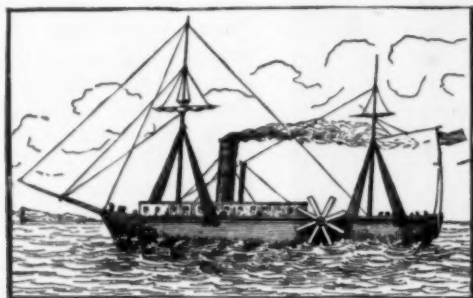
\* From a brochure issued by the Taunton-New Bedford Copper Company, Taunton, Mass.



PHOTOGRAPHIC COPY OF AN ORDER  
FROM ROBERT FULTON TO PAUL REVERE & SON

To Harrison Gray Otis, member of Congress, Revere wrote on March 11, 1800: "It is the universal belief of all coppersmiths that no one in this Country could make Copper so malleable as to hammer it hot. I have farther found it is a Secret that lay in very few Breasts in England. I determined if possible to find the Secret and have pleasure to say that after a great many tryals and considerable expense I gained it."

The Republic's need for copper sheets and plates was especially brought to Revere's attention when he furnished copper and bronze fittings for the building of the ship "Constitution," but the copper sheets that sheathed the outside of her hull were made in England, because at that time copper had not been rolled in America. However, the sheets were held in place by hand-wrought copper nails made by Colonel Revere.



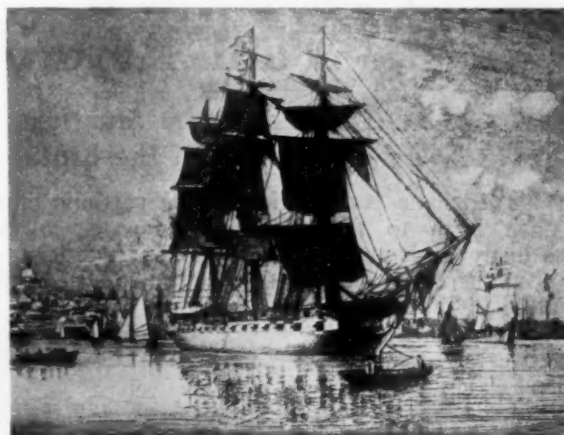
OLD PRINT OF  
ROBERT FULTON'S STEAM BOAT "RARITAN"

With his usual enterprise Paul Revere set himself to acquiring a complete knowledge of rolling copper into sheets. In this he was greatly aided by his previous experience in working metals. In 1801 he was joined in partnership by his son, Joseph Warren Revere, and in that same year they purchased the old government powder mill property situated on the east branch of the Neponset River, which later became the town of Canton, Mass. There they erected a rolling mill. At this time the firm name became "Paul Revere & Son." Early in 1802 the machinery was installed; most of it was undoubtedly built locally, while the rollers were procured from Maidenhead, England.

What a memorable occasion the first sale of rolled copper produced in America must have been! It was made by the Reveres on October 14, 1802, to "Agents for Building the State House" at Boston and was utilized for

covering the dome of the then new Massachusetts State House. A picture of an old steel engraving of the dome is given here, with a photograph of the entry of the sales transaction in Revere's "waste book," or day book, now on file in the Revere memorabilia at the Massachusetts Historical Society.

The "Constitution" or "Old Ironsides," home for repairs, sailed into Boston Harbor early in 1803. It was necessary that she be recoppered, and the Revere mill supplied the metal. The event was recorded by this item in the ship's log under date of June 26: "The carpenters gave nine cheers, which were answered by the seamen and calkers because they had in fourteen days completed copering the ship with copper made in the States." The copper used in this sheathing was shipped by Revere in



"OLD IRONSIDES," IN BOSTON HARBOR. REPRODUCED  
FROM AN OLD STEEL ENGRAVING

three lots. A photographic reproduction is here shown of an entry covering the sale of one of these lots to Samuel Brown, the Naval Agent at Charlestown, Mass.

Always alert to every opportunity to improve their product, Joseph Warren Revere during the year 1804-5 visited England, France, Holland, Denmark and Sweden for the express purpose of perfecting himself in all that pertained to the manufacture of copper. Most interesting evidence of this trip exists in the form of a notebook filled with descriptions and sketches of machinery and methods which he observed.

The growing use of copper in the inventions and industries of their day linked the Reveres closely to many a pioneer effort. For instance, in the spring of 1807 the shipping on the Hudson River was thrown into consternation by the amazing spectacle of Robert Fulton's "Clermont" making her way apparently unaided up the river to Albany. Her copper boiler was made in England.

Fulton's second and third boats—the "Raritan" and the "Car of Neptune"—were built and launched in 1808. In



PAUL REVERE'S BUSINESS CARD

that year John R. Livingston, Fulton's partner, wrote Colonel Revere, saying he had been informed that the Colonel had a mill for the "roleing of copper," and that he desired a price on a quantity of copper weighing 12 pounds to the square foot. On November 22 of that year Robert Fulton himself sent the Reveres a pen-and-ink sketch of the heavy copper plates he wished to buy for the boilers of his new boats.



*John R. Livingston*

Thus was begun a business connection between two pioneers in American industry that continued until Fulton's untimely death in 1815.

The reproduction given here of one of Fulton's orders to Revere is very interesting because of the method of conveying by actual illustration the thickness of metal wanted.

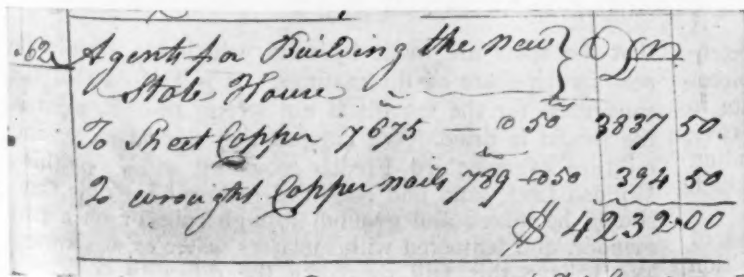
Fulton was an inventor, but he was also an extremely



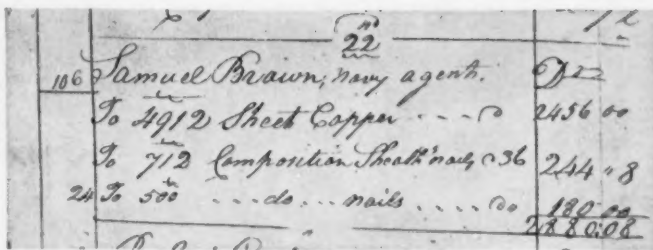
COPPER BOLT FROM FRIGATE "CONSTITUTION"

aggressive and resourceful business man. Because of this, copper ordered from the Revere mill was made into boilers which were placed in the first steam ferryboats in 1811-12, in the "Fulton the First," which was the first steam war frigate, built in 1815, and also in the first torpedo boat.

The incorporation of the Revere copper interests took place in 1828. Colonel Paul Revere continued his active



PHOTOGRAPHIC REPRODUCTION OF ENTRY IN COL. REVERE'S "WASTE BOOK"



PHOTOGRAPHIC REPRODUCTION OF ENTRY IN COL. REVERE'S "WASTE BOOK"

interest and participation in the business up to within a few years of his death in 1818, at the age of eighty-four years. In his will he directed that his son, Joseph Warren Revere, remain in control and management of the copper mill and all other properties.

John Revere, son of Joseph Warren Revere, succeeded to his father's properties and responsibilities, and con-

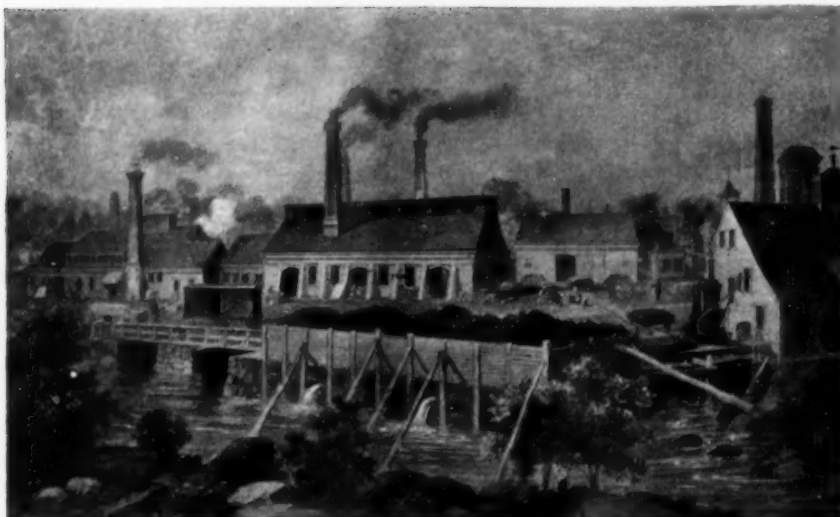


*Joseph W. Revere*

tinued the activities of the Copper Company. Previous to his death in 1886, his son, Edward H. R. Revere, had been associated with him in the business. It continued under the name of "Revere Copper Company" until 1900, when it was consolidated with the Taunton Copper Manufacturing Company, established in 1826, and the New Bedford Copper Company, established in 1860—and was known as the Taunton-New Bedford Copper Company, which it is today. Thus the experience and craftsmanship of these three pioneer organizations in the art of rolling non-ferrous metals were unified.



DOMES OF THE MASSACHUSETTS STATE HOUSE (FROM AN OLD STEEL ENGRAVING)



THE REVERE COMPANY'S PLANT AS DEVELOPED AT CANTON, MASS. (FROM A LARGE WASH DRAWING)



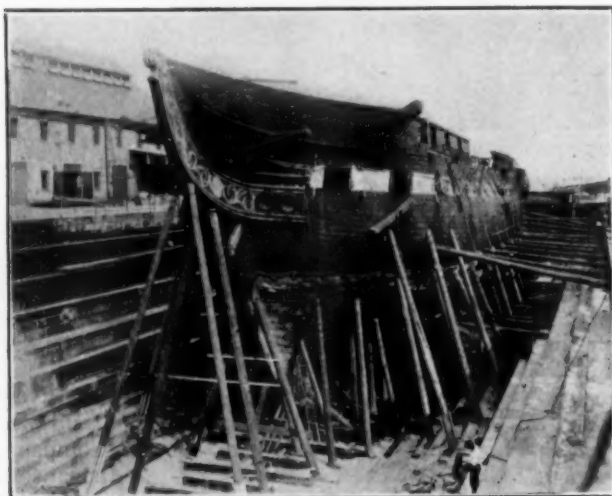
*E. H. R. Revere*

PRESIDENT, TAUNTON-NEW BEDFORD COPPER COMPANY

Eventually Edward H. R. Revere was chosen vice-president of the consolidated organization. This office he held until the latter part of 1927, when, following the death of Henry F. Bassett, who for forty-three years had controlled ably and successfully the conduct of the merger companies, Mr. Revere, great-grandson of Colonel Paul

Revere, was elected president of the Taunton company.

So closes the story of the little-heralded commercial life of Paul Revere and his New England craftsmanship which, beginning in the earliest days of the American Republic, has continued from father to son until the present day.



REBUILDING THE "CONSTITUTION"



THE "CONSTITUTION" UNDER FULL SAIL

## Spots in Brass Castings

Q.—We are sending samples of a finished brass extension bolt plate. The casting is gated up with four pieces in the mould and poured from the center of the gate in an upright position, with head of  $3\frac{1}{2}$  in. over the castings, without top screw holes. We are also sending samples of these castings just as taken from the mould, just cut from the gates.

We would like to have you advise us of the causes of the spots in the faces of these castings. The composition is all new metal; good quality electrolytic copper, best grade horsehead zinc, and a little lead.

A.—Examination with a magnifying glass indicates

that the spots are made by sand, which can plainly be seen in the faces of the castings. It is evident that the sand used for the moulds is not strong enough, even if the mould is dried. We suggest that you make a sand mixture of one-third French moulding sand, one-third Windso Lock sand and one-third heap sand. This sand should be mixed and ground through rolls or on a pan grinder, and tempered with molasses water or salt water. We believe this will overcome the difficulty, which is surely in the sand, and which can easily be seen if the castings are touched on the wheel and examined under a glass.—W. J. REARDON.

# The Development of the Aluminum Industry

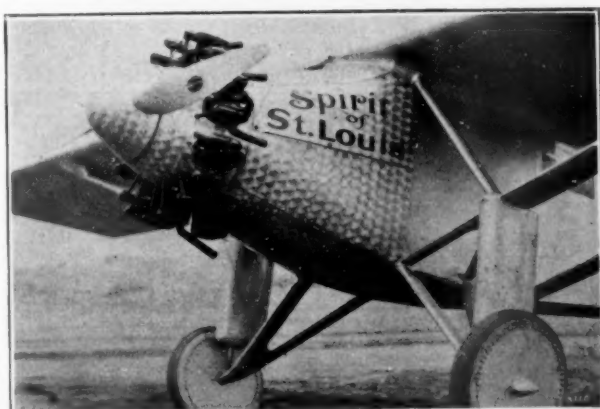
Its Growth from a Laboratory Curiosity to a Great Manufacture. Part 2.\*

By ALUMINUM MAN

WRITTEN ESPECIALLY FOR THE METAL INDUSTRY

## COMMERCIAL FORMS OF ALUMINUM

Much of the aluminum sold today is in the form of ingot. This ingot may either be pure aluminum or one of the many alloys which are so successfully made with aluminum. Ingot is purchased by concerns who fabricate it into articles of various sorts and kinds. Obviously, the largest ingot users are foundrymen. The steel industry purchases many tons of aluminum ingot where it is used as a deoxidizing agent. The development and introduction of a number of strong alloys of aluminum has much enlarged the field of its usefulness. Practically all of these alloys, in addition to being stronger than the pure metal, are also susceptible to heat treatment, by means of which the tensile strength, elongation and other physical properties can be brought to a point much above those for pure aluminum. The commonest alloy ingredients are copper, magnesium, silicon, etc., which act with aluminum much in the same way that iron and carbon behave to form steel.



AN ALUMINUM PROPELLER WHICH CROSSED THE ATLANTIC

Strong aluminum alloys are by no means confined to products which can be cast. On the other hand, by far the largest use is probably in the form of strong alloy sheets. There are many strong aluminum alloys, probably the best known being what is called duralumin, a strong alloy which originated in Germany. This alloy and modifications of it find wide use today. Being light and having a strength equal to mild steel it immediately finds application in the construction of both lighter than air and heavier than air flying machines.

Probably the most outstanding and important achievement in the aluminum industry for 1927 was the development of Alclad. Alclad consists of a core of strong alloy sheet covered on both sides by a thin film of pure aluminum, which is actually an integral part of the core and which gives to the alloy properties of corrosion resistance which are phenomenal. The pure metal comprises about 5% of the total thickness on each side. In any given gauge, therefore, the strong alloy core is 90% and the pure aluminum 10% of the whole.

The obvious application of Alclad is, of course, in the aircraft industry, where it is particularly indicated for

the fabrication of sea-planes and land-planes which are subject to corrosive action from moisture of one sort and another. (A complete description of Alclad can be found in Technical Note No. 259 of the National Advisory Committee for Aeronautics.)

From heavy and intermediate gauges of sheet the natural progression is to the rolling of thin gauge sheet and finally to foil. Aluminum foil can be rolled commercially as thin as .0003 inches, and large quantities of material of this very light gauge are used in the confectionery, tobacco and other industries.

The use of aluminum foil increases constantly, and in the confectionery trade it has almost entirely supplanted the use of pure tin and composition foils. Aluminum foil is also used in the manufacture of fixed electrical condensers.

One particularly interesting development which has taken place in the last two or three years is the use of aluminum bronze powder as a paint pigment. In a comparatively short time aluminum bronze powder has taken its place with the older and more commonly known pigments. Aluminum bronze powder is not really a powder, but consists of tiny flat flakes of pure aluminum. These flakes, when mixed with a vehicle of the proper consistency, have the peculiar property of leafing and coming up to the surface of the vehicle whether the vehicle be standing in a container or whether it has been spread out by means of a brush or sprayed on a surface by means of a spray gun. This characteristic leafing forms within the paint film a layer of tiny scales piled flat on top of one another and overlapping each other much in the same way that fish scales grow on the body of a fish. The only difference is that instead of being laid out in regular order the flakes of aluminum are irregular. However, the net result is the same, and in the case of the paint it is most important. Most paint deteriorates not through actual contact with the weather, but because of the destructive properties of the ultra-violet rays in sunlight. Aluminum is opaque so that by virtue of the formation of this continuous layer of tiny aluminum flakes you have an actual coat of metal protection. The vehicle in the interstices of, and the vehicle beneath the scaly armor is preserved for a much longer time than when ordinary granular paint pigments are used.

Other properties of aluminum paint are equally important, such as its high degree of reflectivity, which makes it the best paint to use on oil storage tanks to keep the temperature down and to prevent loss by evaporation of the most valuable constituents of the oil stored in the tank.

Aluminum being very resistant to certain gases, aluminum paint finds particular application about certain kinds of industrial plants where ordinary paint is soon discolored or destroyed and has but a short life. Its reflectivity also makes it an excellent paint to apply in dark workshops. Aluminum has been found to be a superior paint for a priming coat on wood because of its moisture resisting qualities. Wood ordinarily deteriorates because of the fact that it absorbs and gives off moisture with consequent expansion and contraction and ultimate destruction through rot and weathering.

\*Part 1 was published in our March issue.

## NEW FIELDS AND USES FOR ALUMINUM

Strong aluminum alloys can be machined with great ease and have a particularly pleasing finish either as machined or polished. There is an ever increasing use for and development of aluminum screw machine products. Aluminum wood and machine screws are now commonly in use in the automobile, aeroplane and other industries which require a strong light-weight, durable material. This year has seen the advent of an aluminum tire valve which, among other things, due to its light weight, is of particular interest to tire and wheel manufacturers since it makes less difficult the problem of balancing wheels and tires. Aluminum cotter-pins have also been developed and are manufactured in various sizes. They have been uniformly successful in the applications to which they have been put.

## ROOFING MATERIAL

Another interesting development is that of aluminum nails which are not only particularly applicable to the field of roofing material, but have also been found to be especially well suited where certain special conditions exist. In the Southwest there are certain crude oils which are called "sour." These oils, because of their high sulphur content, are particularly destructive to iron and steel, and it has been found that ordinary iron wire nails rust out rapidly and increase tremendously the maintenance cost of tank roofs and other equipment. The aluminum nail was developed to a certain extent to meet this demand, and the results so far have been most encouraging, for aluminum resists the corrosive action of this "sour" crude and the nails have been absolutely successful wherever applied.

Aluminum itself is suitable for a roofing material, and the past four or five years have seen the successful development of an aluminum shingle. Unlike most metal roofs, aluminum shingles not only give the maximum amount of protection and resistance to corrosion or weathering, but also provide a light-weight roof. Of particular interest is the "Top Down" shingle now on the market. As its name implies, it can be applied from the ridge of the roof down, obviating the necessity for the roofer to walk on any part of the roof which has already been laid. Likewise, the scaffolding is erected on the roof frame instead of on the finished roof. Another advantage is the fact that the labor cost for applying "Top Down" shingles is from 50% to 70% less than that for other types of roofing. In addition to the shingles themselves the various accessories are also manufactured, so it is possible to have a roof which is entirely of aluminum.

## IN RADIO

In order to meet the demand for material combining light weight and great strength there has been developed a technic by means of which structural shapes can be rolled from the strong alloys of aluminum in lengths of 80 feet and upward. The obvious application for such structural material lies in the transportation field, and as a matter of fact that is where it is mostly used. Aluminum rod and bar, of course, find one of their largest applications in the fabrication of screw machine products. Bar and rod are also used in the manufacture of rivets, cotter-pins, buttons, golf tees and various other small articles of this type. A new use for aluminum rod is in radio battery eliminators, where it is found as an electrode.

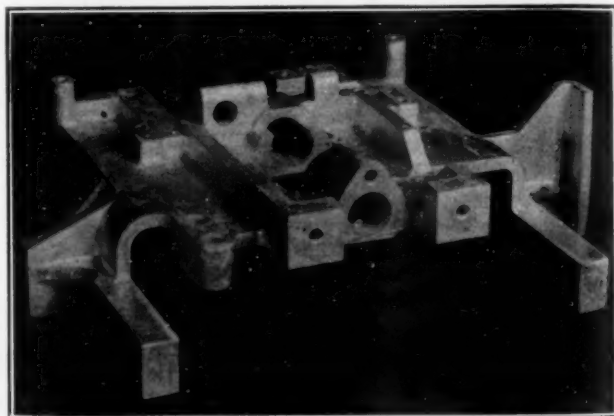
The radio industry uses considerable quantities of aluminum. Some of it is in the form of screw machine parts, some of it in the form of die-castings and some in the form of sheet and various other products. There has been developed a very high grade of sheet which finds its particular application in the construction of variable condensers. This sheet is not only extremely flat and very highly finished, but also is held to a very close gauge tol-

erance. Aluminum is also an ideal material for shielding, and a large majority of manufacturers who shield their radio sets have chosen aluminum as the material for this purpose.

Aluminum tubing has been manufactured for years, and the applications for which it is particularly suited are many. Recent years have seen marked betterment of manufacturing technic so that aluminum can now be obtained in a wide variety of diameters and wall gauges. As in the other products, strong aluminum alloys can also be drawn into tubing and aircraft manufacturers are very much interested in this product not only in round but also in oval and stream-line shapes. Aluminum has been used for some time as hand-rails and stanchions in street cars and buses. There is also available a rigid aluminum conduit which is particularly adapted to use where the question of weight-saving is of importance, where the question of resistance to corrosion is essential and finally where it is necessary to have a non-magnetic electrical conduit. Aluminum tubing is used in pneumatic conveyor systems in department stores, banks, etc. In addition to aluminum tubing itself, it is also possible to obtain all the various fittings and accessories in the same metal.

## DIE-CASTING MATERIAL

Aluminum is cast not only in sand, but also in metal dies. There is a very large field for aluminum die castings which range from tiny parts for precision machines up to castings which weigh nine and ten pounds and have dimensions roughly 7 inches deep by 17 inches square. As a matter of fact, the limit to the size of a die-casting



AN ALUMINUM DIE-CASTING

is governed to a great extent by the size of the forged steel die blocks which it is possible to obtain. Aluminum die castings are used in washing machines, vacuum cleaners, radio sets, radio loud speakers, etc., etc.

## PERMANENT MOULD CASTING

In addition to die casting in metal moulds by pressure it is also possible to cast aluminum in metal moulds by gravity, and this latter process is known as permanent mould casting. One of the best known products of the permanent mould process is the aluminum alloy piston which is being more and more extensively used in the automobile industry. Aluminum pistons are not only suitable for the internal combustion engine used in an automobile, but are also used in Diesel engines, marine engines and stationary internal combustion engines. The technic of producing aluminum pistons and the development of their application is such that it is now possible to fit an aluminum piston with a tolerance of less than that ordinarily used for a cast-iron piston.

This article will be concluded in an early issue.—Ed.

## British Institute of Metals

### A Report of the Twentieth Annual General Meeting, Held in London, March 7 and 8, 1928

At the Twentieth Annual General Meeting of the Institute of Metals, held in London on March 7, 8, 1928, the retiring President, Sir John Dewrance, K.B.E., presented the Report of Council for the past year.

The Report, of which the following is a summary, stated that "the Council feels that the Members can congratulate themselves upon the continued progress of their organization. The Institute has increased in status, in membership, in financial resources, and also in the extent of its Library and office accommodation."

The membership has increased during the year from 1801 to 1903.

The Council has under consideration the desirability of arranging further foreign meetings, and a committee has been appointed to explore this matter.

Steps taken by the Council to secure more practical

papers are mentioned in the report, and reference is made to the progress of the institute's journal.

The six local sections of the institute continued their good work during the year. A notable feature of the meetings of these sections was that many were held jointly with other kindred societies. In accordance with the new articles of the association, the council, for the first time, exercised its power to co-opt a chairman of a local section as a member of council, the choice falling upon Mr. A. H. Munday, Chairman of the London Local Section.

The council directs attention to the extent to which the institute's membership has now become world wide. Whereas ten years ago, out of a total membership of 888 only 200 resided overseas (in 25 countries), the 1927 total of 1903 members included 700 overseas members resident in 41 countries.

## Synopses of Papers

### The Deterioration of Lead Cable Sheathing by Cracking and Its Prevention, by S. Beckinsale and H. Waterhouse.

The cause and prevention of the intercrystalline failures sometimes found in lead cable sheathing are discussed. The situations in which cable sheathing has failed by cracking are described, samples of cracked sheathing have been examined, and explanations advanced to account for this type of failure have been considered. The results obtained indicate that the defect is a fatigue type of failure produced by small alternating stresses. It has been found that the addition of other metals to lead raises the fatigue limit and so increases its resistance to this type of failure. Amongst the alloys which have been found very effective are certain ternary alloys containing cadmium, which are described in this paper.

### The Dilatometric Study of Light Metals, Max Haas.

Improvements in the Oberhoffer-Esser dilatometer are described, with special application to the study of light metals.

### The Thermal and Electrical Conductivity of Some Aluminum Alloys and Bronzes, by Ezer Griffiths and F. H. Schofield.

Two groups of alloys were investigated:—(1) Those rich in aluminium, with nickel, magnesium, iron, zinc, manganese, or silver as second or third constituents; (2) those rich in copper, with tin, zinc, lead, manganese, or aluminium.

The aluminium alloys were found to possess a thermal conductivity of roughly 70 to 80 per cent that of pure aluminium, whilst the bronzes range from one-fifth to one-tenth of the value for copper.

In contrast with the pure metals the alloys all give considerable increase of thermal conductivity with temperature.

A comparison of two bronzes of identical composition, except for the presence of a minute amount of phosphorus, shows that the latter produces a marked lowering of the thermal conductivity.

The lowering of the conductivity of copper due to an admixture of 10 per cent of aluminium is comparable with that due to the same amount of tin.

Of the aluminium alloys tested, the 8 per cent copper and the 4.5 per cent copper showed the highest conductivity, amounting to 82 per cent that of pure aluminium.

The lowest thermal conductivity of the series was given by a 13 per cent zinc, 3 per cent copper alloy, which had a conductivity of 64 per cent aluminium.

The ratio of the thermal to the electrical conductivity in the range 80° to 300° C. obeys Loren's law with one or two exceptions.

### The Constitution of the Alloys of Magnesium and Zinc, by R. Chadwick.

This paper contains the account of an investigation of the equilibrium diagram of the magnesium-zinc system.

Both thermal and micrographic methods have been used, the system having been investigated at all compositions and down to 200° C.

The metals form two intermetallic compounds,  $MgZn_2$ ,  $MgZn_5$ , and all four solid phases:—Mg,  $MgZn_2$ ,  $MgZn_5$ , and Zn, have been shown to form solid solutions.

A summary is given of the method of analysis of the alloys, in which the magnesium and zinc are precipitated separately as pyrophosphates from the solution of mixed chlorides.

### Historical Note on Density Changes Caused by the Cold-Working of Metals, by Hugh O'Neill.

Priority for the observation that its density decreases when a metal is cold-worked is generally attributed to certain Continental workers, notably to Spring (1891). It appears that Berzelius (1844) may previously have noticed the effect, but it is certain that Charles O'Neill of Manchester published a careful research upon the subject thirty years before the work of Spring was printed.

### Season-Cracking of Small-Arms Cartridge Cases During Manufacture, by F. S. Grimston.

The first portion of this paper deals with the attempts made to ascertain the existence of internal stress by inducing season-cracking by means of chemical action.

The second portion describes certain methods used to detect surface tension in the walls of the cases by measuring the contraction which takes place after removal of the inner supporting metal. Certain definite conclusions are reached. Illustrations are given of the dies used, and of cases showing season-cracks produced in the manner described in the paper.

### The Ball Hardness and the Cold-Working of Soft Metals and Eutectics, by F. Hargreaves.

It is shown for a number of soft metals and eutectics that the relation between diameter of impressions and

duration of loading is given by the equation  $d = cts$ , where  $d$  = diameter of impression,  $t$  = duration of loading, and  $s$  and  $c$  are factors which vary in certain ways.

Temperature of testing is shown to be of great importance and the total inadequacy of the Brinell hardness figure as a general method of expressing the hardness of soft metals is demonstrated. It is suggested that the ball hardness of soft metals be expressed as in the following example. Tin (10 m.m./100 k.g./30 ecs/15°C) Brinell hardness 5.3  $s = 0.050$ .

It is found in all the cases examined that the effect of work is to increase factor "s" and it is suggested that in the case of pure metals it is a measure of the rate of spontaneous annealing.

The work softening of some eutectics is investigated and it is shown in the case of the lead-tin eutectic that the rapid fall in Brinell hardness between 20 and 30 reduction in thickness is coincident with the rapid increase in the rate of spontaneous annealing of the main constituent tin.

#### **The Behaviour of Metals and Alloys During Hot-Forging, by W. L. Kent.**

Small cylindrical specimens of pure metals and some brasses were forged with a standard blow of 50 ft.-lb. at temperatures up to the melting points, and the mechanism of hot forging was investigated by measurements of the degree of compressions produced and by comparison of the Brinell hardness values so obtained. The following conclusions were drawn:

(1) That although the forging test does not measure the malleability of a metal or alloy, it will indicate the relative forgeability at different temperatures; and also the liability for cracking to occur during the operation. It appears that if the working properties of a metal or alloy are to be determined by ordinary mechanical tests, then the joint results of forging and notched-bar impact tests will give the best approximation to the truth.

(2) When a metal is worked at elevated temperatures it strain-hardens in much the same way as at normal temperatures, but not to the same extent. The degree of strain-hardening in copper decreases progressively, but very slightly, as the temperature is raised to 550°C. (Recrystallization commenced at 600°C. and was complete at 650°C.)

(3) That continuous hot-forging is in some cases made possible by the very rapid recrystallization and consequent softening of the material, as, for example, copper; but in some cases the actual softness of the metal at elevated temperatures is an aid to hot-forging, as, for instance, aluminium, where rapid recrystallization does not occur and there is a residual hardness even after forging at 650°C. The progressive decrease in strain-hardening postulated above for copper is probably greater in the case of aluminium.

(4) The forgeability of 70:30 brass increased but little up to 750°C., but that of 60:40 brass increased steadily between 400°C. and 600°C., and very rapidly from that temperature to the melting point. The presence of lead caused cracking from 350°C. upwards, but in 60:40 brass the cracks disappeared at 700°C., and the material containing lead produced a better forging than the pure alloy.

#### **Minute Shrinkage Cavities in Some Cast Alloys of Heterogeneous Structure, by W. A. Cowan.**

Minute shrinkage cavities in certain heterogeneous alloys are described in this paper as due to shrinkage, accompanying change in volume between liquid and solid phases, of a relatively low freezing-point component, where it last freezes after the bulk of the alloy has solidified at higher temperature.

As an instance of this, some tin-base alloys are shown

to contain minute shrinkage cavities when small percentages of lead are present, but to be practically free from similar cavities with no lead content. The main component of the alloys described is solid solution of antimony in tin, which solidifies at 237°C., while the component present in small amount, being the eutectic mixture with lead, solidifies at a lower temperature (183°C.), thus producing minute shrinkage cavities. Photographs are shown to illustrate this.

An examination of the microstructure of the alloys containing some lead shows cavities located at eutectic areas, probably between crystalline grains, while similar alloys without any lead content show no cavities.

Cavities in cast metals are formed by a number of different causes, and their occurrence should be correctly assigned to the actual causes, and instances of shrinkage recognized as such.

#### **Note of the Composition of Old Roman Lead, by W. A. Cowan.**

Reference is made to composition of old Roman lead found in England, as previously reported by Friend and Thorneycroft.

Analysis is given of a specimen of old Roman lead pipe found in Rome, dating from A.D. 79, showing it to be of similar composition to that found in England.

#### **The Influence of Dissolved Gases on the Soundness of 70:30 Brass Ingots, by G. L. Bailey.**

The work described had the object of determining whether unsoundness could be induced in 70:30 brass ingots by treating the molten metal with various gases before pouring. Preliminary experiments on bronze (an alloy known to be susceptible to gas effects) showed that treatments with nitrogen gave an ingot practically free from unsoundness due to gas. Comparative tests were made on samples of 70:30 brass treated with nitrogen, hydrogen, and sulphur dioxide, poured in a series of molds giving different speeds of solidification. No evidence was obtained in any of the treatments of unsoundness in the ingots caused by gas evolution during solidification.

It is concluded that if appreciable amounts of gases are soluble in liquid brass the solubility in the solid state is sufficiently high to retain the gas in solution. The probability is, however, that the high vapor pressure of zinc in molten brass precludes the solution of gas by the alloy.

#### **The Effect of Quenching and Tempering on the Mechanical Properties of Standard Silver, by A. L. Norbury.**

Standard silver (92.5 per cent silver, 7.5 per cent copper) as ordinarily annealed contains a considerable amount of copper (in which some silver is dissolved), distributed in the form of small particles throughout the silver solid solution matrix. By suitable heating (e.g. about half an hour at 770°C.) and quenching, these copper particles may be dissolved and retained in supersaturated solid solution in the silver.

The alloy when in the quenched condition is about 30 per cent softer and 20 to 30 per cent more ductile than it is when in the as ordinarily annealed condition.

On suitable tempering the quenched alloy (e.g. about half an hour at 300°C.) its Brinell hardness increases by about 300 per cent., and its tensile strength by about 50 per cent. At the same time its ductility falls by about 50 per cent. These effects are due to the decomposition of the supersaturated solid solution of copper in silver.

The hardening on tempering is accompanied by a decrease in volume.

The hardening obtainable by tempering is uniform, and is consequently superior to the hardening obtainable by rolling, stamping, and similar operations where the hardening is not uniform and sets up stresses and strains in the alloy.

It is possible to harden the quenched alloy by cold-work and then further harden it by suitable tempering.

On cold-working specimens tempered at different temperatures, and consequently of greatly different hardnesses, the specimens tend to become equal in hardness as the amount of deformation is increased.

The alloy is more resistant to oxidation and tarnishing when in the quenched and tempered conditions than it is when in the annealed condition.

#### An Example of Roman Copper "Soldering" and Welding from Uriconium, by J. Newton Friend and W. E. Thorneycroft.

A Roman iron ferrule from Uriconium has been examined, and micrographs are given. It appears to have been made by welding two small pieces of iron into a strip, bending it over, and joining the two ends with copper. This appears to be the first example of copper "soldering" of Roman origin to be examined.

#### The Relative Corrodibilities of Ferrous and Non-ferrous Metals and Alloys. Part I—The Results of Four Years' Exposure in the Bristol Channel, by J. Newton Friend.

Fifty bars of ferrous and non-ferrous metals were exposed to sea action in the Bristol Channel for four years, and an account is given of the 14 non-ferrous bars. Losses in weight, depths of pitting, reduction in diameter, and fall in tensile strength in consequence of corrosion are correlated. The metals examined included tin, lead, nickel, zinc, aluminium, and various coppers and brasses. Nickel, tin, and lead resisted corrosion remarkably well. Of the brasses, screw metal (1.37 per cent lead) made the best showing. This was closely followed by the nickel-copper (1.75 per cent nickel). A galvanized iron bar lost less in weight than either the iron or the zinc separately. The aluminium bar was very deeply pitted. Dezincification of the brasses is discussed. The relative rates of cor-

rosion of ferrous and non-ferrous metals and alloys are compared.

#### The Alloys of Zirconium—I, by T. E. Allibone and C. Sykes.

An account is given of some physical properties of certain alloys of zirconium.

The structures of partial series of the alloy systems copper-zirconium to 35 per cent zirconium nickel-zirconium to 55 per cent zirconium, and iron-zirconium to 30 per cent zirconium are given. In each case the system is eutectiferous, and inter-metallic compounds are formed. In the copper-zirconium system the compound  $\text{Cu}_3\text{Zr}$  is found; in the nickel-zirconium system two compounds, probably  $\text{Ni}_2\text{Zr}$  and  $\text{Ni}_4\text{Zr}$ , are found in the range of alloys investigated. The solid solubility of zirconium in the pure metals copper, nickel, and iron is in each case very small, that is, less than 0.5 per cent.

The measurements of hardness, tensile strength, and ductility of certain alloys are recorded. The vacuum high-frequency induction furnace in which the alloys were made is also described.

#### On the Quenching and Tempering of Brass, Bronze, and Aluminium-Bronze, by Tsutomu Mathuda.

The effect of quenching and tempering on the microstructure, electrical resistance, hardness, and other mechanical properties of brass, bronze, and "aluminium-bronze" was examined. It was confirmed that these copper alloys containing a proper amount of the second metals may be hardened by suitable heat-treatment.

The nature of the temper-hardening was investigated by means of microscopic and dilatometric tests and electrical resistance measurements, and it was concluded that the hardening is accompanied by the separation of  $\alpha$  from  $\beta$  or  $\gamma$ , or the decomposition of  $\beta$  or  $\gamma$  into eutectoid, or both of these changes, and probably due to the straining of space lattice produced by these structural changes.

## Slab Mold Dressing

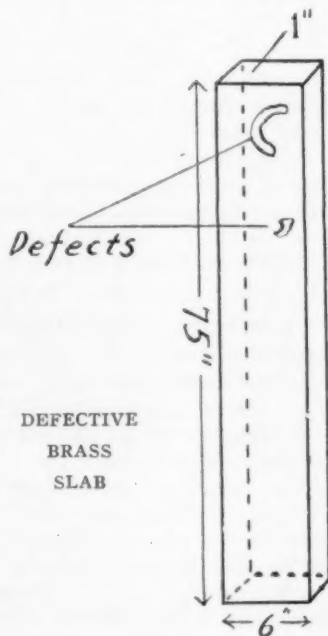
By WILLIAM J. PETTIS

Rolling Mill Editor

Q.—You would oblige me very much in getting me the following information: We dress our slab mold in which we cast our 65-35 copper-zinc alloy, with the well known lard oil kerosene lamp-black dressing, getting the very best result on this. However, dressing molds for Muntz metal 60-40, no lead, with the same dressing, we experience plenty of trouble. A gas seems to form, leaving a clean hole or a long stretched cavity in the metal surface. Our mold surface is covered after pouring with a metallic looking precipitate, which looks like zinc. We wonder if any reduction may take place between formed zinc oxide and dressing.

Is it the custom to use a different dressing for the two alloys? If so, in what should they differ?

A.—The general practice of the rolling mills'



casting shops, is to use a good grade of lard oil for dressing the molds, and this is used on all the commercial copper-zinc alloys, with uniformly good results. I am not familiar with the "lard oil lampblack kerosene" mixture you refer to, and unless there is some advantage in reducing the flash point of the lard oil, that has been demonstrated, I would leave it out. However, if it is giving good results on the 65-35 alloy, you can safely discount it as a cause of your trouble with the Muntz metal, and look for the cause elsewhere.

This is difficult to point out from a distance, as there are several things that might cause this trouble. Muntz metal will chill faster than the 65-35 alloy, and the mold you use (1" x 6" x 75") would hasten the chilling. As the gas release comes with the cooling of the metal the gases are "pocketed." Speed of pouring, and temperature of metal are important in combination. If you use a "pouring cup," or "strainer," about four,  $\frac{3}{8}$ " holes, should give you the proper pouring speed. The standard molds run from  $1\frac{1}{8}$ " thick. This should give you a shorter mold and a slower cooling body of metal, and should give better results than the mold you are using on the Muntz metal slabs.

The position of the mold is important. If the stream strikes the backs of mold at too acute an angle, pits will appear at about that point. The zinc precipitate on the mold is a normal condition, when pouring this high zinc alloy at high temperature, and should give no trouble.

## Materials Testing Society Meeting

A Report of the Group Meeting of Committees at the Mayflower, Washington, D. C.,  
March 21-23, 1928

The regular spring group meeting of committees of the American Society for Testing Materials was held at The Mayflower in Washington, March 21, 22 and 23, 1928. This plan of holding a number of committee meetings over consecutive days, which is probably unique in the activities of this Society, has worked out very successfully, conserving the time and expense of those members serving on a number of committees. The group meetings are quite impressive, the one recently held especially so with over 475 members gathered together, not in the usual type of convention but for the sole purpose of advancing the work of the standing committees. The committees met early and late, starting with sessions in the morning and some of the committees having sessions extending up until midnight. In all 26 committees of the Society took part, but with the many sub-committee meetings that were necessary the number of meetings held during these three days totalled approximately 94. In addition, meetings were held of the Joint Research Committee, of the A.S.T.M. and the A.S.M.E., on Effect of Temperature on the Properties of Metals, of the Sectional Committee on Zinc Coating of Iron and Steel, and of the Sectional Committee on Copper Wire.

Reports follow of the work of the committees engaged in non-ferrous metals:

### COMMITTEE B-3 ON CORROSION OF NON-FERROUS METALS AND ALLOYS

**Chairman:** T. S. Fuller, Metallurgist, Research Laboratory, General Electric Company, Schenectady, N. Y.

**Secretary:** Sam Tour, Metallurgist, Doehler Die Casting Company, 123 North Street, Batavia, N. Y.

Committee B-3 on the Corrosion of Non-Ferrous Metals and Alloys at its meeting held in Washington on March 22 considered the reports of its various sub-committees on both accelerated and exposure tests. The committee's plans for carrying out long time service tests have been completed and will be put into execution as soon as the necessary funds now being solicited from the industries are forthcoming.

### JOINT ADVISORY COMMITTEE ON CORROSION

**Chairman:** W. H. Bassett, Tech. Supt., American Brass Company, Waterbury, Conn.

**Secretary:** C. D. Hocker, Chemical Engr., Bell Telephone Laboratories, New York City.

The Joint Advisory Committee on Corrosion is an administrative committee consisting of appointed representatives from the two A.S.T.M. committees that are studying corrosion, namely, A-5 on Corrosion of Iron and Steel and B-3 on Corrosion of Non-Ferrous Metals and Alloys. Its function is to correlate the activities of the two committees and also to advise with the Executive Committee of the Society in matters relating to the field of corrosion-resistant metals and alloys.

In the latter capacity the committee met at the Hotel Mayflower, Washington, D. C., on Thursday, March 22, to consider a proposal that had been made to form a committee of the Society to study a group of corrosion-resistant alloys that lies between the fields at present being developed by the two corrosion committees. An enlightening and valuable discussion developed in the con-

sideration of this proposal, which crystallized in a recommendation to the Executive Committee of the Society that it form a new standing committee in the Society to study the alloys of the iron-chromium-nickel system, the committee to have adequate representation from both producing and consuming interests and to function under a scope which would include studies of all properties of the alloys in this system.

The discussion brought out clearly the importance of consideration of these alloys by the Society—in the beginning necessarily from the investigative point of view but with the thought that when the time is appropriate standard specifications and tests covering these alloys might be prepared.

### JOINT RESEARCH COMMITTEE ON EFFECT OF TEMPERATURE ON THE PROPERTIES OF METALS

**Chairman:** G. W. Saathoff, Chief Construction Engineer, Henry L. Doherty and Company, New York City.

**Secretary:** F. M. Van Deventer, Henry L. Doherty and Company, New York City.

The Joint Research Committee of the American Society for Testing Materials and the American Society of Mechanical Engineers on Effect of Temperature on the Properties of Metals met on March 22 coincidentally with the A. S. T. M. group meeting in Washington.

Further progress was reported concerning co-operative laboratory work which has been under way for some time. In addition to further reports on short time tests, one laboratory submitted its report on flow tests. An attempt will be made to coordinate the results from short time and flow tests.

Satisfactory arrangements being assured, it is expected that laboratory work on fatigue at elevated temperatures and thermal conductivity will be under way in the near future.

A bibliography prepared by this committee was examined in proof form and will be available to the public in a few weeks.

A sub-committee report on service information was received. This report embodied a tabulation of the returns from a questionnaire sent to users of high temperature materials under various kinds of service. Since it was not decisively apparent whether it will be feasible or proper to publish such a report, it was referred back to the sub-committee for further study.

### SECTIONAL COMMITTEE ON SPECIFICATIONS FOR ZINC COATING OF IRON AND STEEL

**Chairman:** J. A. Capp, Chief of Testing Lab., General Electric Company, Schenectady, N. Y.

**Vice-Chairman:** C. S. Trewin, Technical Dept., New Jersey Zinc Company, New York City.

**Secretary:** S. S. Tuthill, Secretary, American Zinc Institute, New York City.

The Sectional Committee on Specifications for Zinc Coating of Iron and Steel, which functions under the procedure of the American Engineering Standards Committee and is sponsored by the A. S. T. M., held its annual meeting at the Hotel Mayflower, Washington, D. C., on Friday, March 23. As the first order of busi-

ness the committee re-elected its present officers for the ensuing term of two years. Reports from the several technical committees were then received and acted upon as follows:

**Technical Committee II on Sheet and Sheet Products.**—In the absence of the chairman, J. T. Hay, the secretary of the technical committee, A. C. Badger, presented a Specification for Zinc Coating of Iron and Steel Sheets, which had been formed by excerpting from the present A. S. T. M. Standard Specifications for Galvanized Sheets all the requirements respecting quality and tests of zinc coating, omitting requirements for the base metal sheet. The specification was adopted by the meeting with the understanding that if approved by letter ballot vote it would be offered to the sponsor for ultimate approval by the A. E. S. C. as American Standard.

**Technical Committee III on Plates, Bars, Structural Shapes and Their Products.**—V. F. Hammel, chairman of this committee, presented a Tentative Specification for Zinc Coatings of Structural Steel Shapes, Plates, Bars and Their Products. After full consideration, during which a number of questions were raised and referred to the committee for further action, the specifications after slight modification were referred to a letter ballot vote of the entire committee for submission to the sponsor for publication as tentative.

**Technical Committee IV on Pipe, Conduits and Their Fittings.**—F. N. Speller, chairman of the technical committee, reported that the committee had made considerable progress and offered certain material for publication as the basis of specifications in this field. The Sectional Committee voted to receive this report to be published as information in its report to the sponsor.

**Technical Committee V on Wire and Wire Products.**—J. C. Johnson, chairman of the technical committee, explained the activities of the three sub-committees who are handling the following phases of the work of that committee: Telephone, Telegraph and Signal Wire—Stranded Wire, and Fencing—Woven Wire Products. The report included proposed specifications covering zinc coating of certain wire products, which were received by the Sectional Committee for inclusion in its report to the sponsor.

**Technical Committee VII on Methods of Testing.**—C. D. Hocker, chairman of this committee, reported considerable progress in the study of methods of testing zinc coatings, explaining that this technical committee has been functioning also as the Sub-Committee on Methods of Testing of the A. S. T. M. Committee A-5 on Corrosion of Iron and Steel where a number of problems of importance are being studied. The Sectional Committee has referred to Technical Committee VII all of the specifications reported at its meeting for study as to test methods.

## Alloy for Mill Bearings

Q.—We are having a great deal of trouble in making up bearings which are used on large rolls in a rolling mill. We have tried an 88-10-2 mixture and also a 90-10 and have increased this to 88% copper and 12% tin. The complaint seems to be that the metal is soft. In making up these castings we have taken every precaution and have been very careful to mix the metal very thoroughly, and not to overheat same. We are using a good ingot copper and first-class tin. As we have no other complaints from our customers who buy our bearing metal, it perhaps is not the fault of the metal, but rather that we may need a different mixture. The bearings, when in use, are greased with a hard grease and water is pouring over them continually. Instead of the bearing wearing out, it is squeezed out. The bearings have to stand not only hard wear, but also a heavy chattering.

A.—As you have been having no trouble with your

other bearings, it is evident that the trouble is in your mixture. There are a large number of different metallic alloys used in bearings. Some are exposed to a considerable amount of abrasion. These alloys are used because they are less prone than other metal to produce frictional heat and be destroyed either by fusion or by the seizing up of the bearing.

They are usually known as anti-friction or bearing metal and the alloy for this purpose varies. From what you say of the job you have, we would suggest that you try a mixture of 78 copper; 18 tin; 2 zinc; 2 nickel. In making this metal, use a 50 copper and 50 nickel alloy. Your mixture should be 76 copper; 4 nickel copper alloy; 18 tin and 2 zinc. Melt the copper and nickel shot, and add the tin a little at a time, stirring well after each addition of tin. This alloy is approximately what is used for locomotive axle bearings.—W. J. REARDON.

## Dross Spots in Brass Castings

Q.—We have been having trouble in getting brass castings such as the sample herewith to come out smooth after buffing. As you will note, there are dark spots and small hair or drag lines. We would like to know the cause of this. We have tried changing the mixture of metal and also the sand mixture, but nothing seems to overcome the difficulty. We pour the metal at 1900° F.

A.—Upon examination of sample yellow brass casting, we find your trouble is due to aluminum in the metal. This causes dross. If you will place your sample casting under a glass you will see the dirty porous condition. The less aluminum used the greater will be the chance of getting clean castings. Two ounces should be sufficient. The dross is formed as the metal enters the mold. It is a case of exercising skill in the manner of gating. The molder should bear in mind that aluminum is a metallic soap. It has the same properties in metal that soap has in water. It makes a foamy lather and this

lather is dirt and dross. If the molder can devise a gate that will ease the metal into the mold without lather or foam, he will solve your problem.—W. J. REARDON.

## Twinning in Metals

During the winter meeting of the Institute of Metals Division, February 21-24, 1928, in New York, Dr. C. H. Mathewson of Yale University, New Haven, Conn., delivered the annual Institute of Metals lecture on Twinning in Metals. Dr. Mathewson advanced the theory that the formation of twins is as essential to flow in many metals during working as is crystalline slip. The formation of twins in the original crystals may be, in many cases, the earliest result of overstrain. Later deformation of a severe type results in the development of the crystalline twins and slip along crystal planes. The lecturer developed his theory from the action of large crystals of zinc which he had studied.

## Salt Water Gilding

Q.—During the war, when the German ships were interned at Newport News, we were asked to supply the buttons for their uniforms and after manufacture were told to apply a so-called salt water formula for protection and gold coloring. This was done, but in some way the formula was misplaced, and now that we have customers interested in the same finish, we are very anxious indeed to discover what this is. Can you tell us what this finish might be which we understand is called a salt water spray?

A.—We presume you mean gold coloring by means of the salt water gold solution, not a salt water spray. The data below cover the process in detail.

It is necessary that all the articles to be gold plated by the salt water process be polished and cleansed just as in regular gold plating or other metallic deposition. The treatment here outlined does not require more than 30 seconds.

### SALT WATER GILDING OUTFIT

This consists of a round copper kettle about 20 inches deep and the same diameter, heated with copper steam coils about  $\frac{3}{8}$  inch thick. Inside of this kettle is placed a porous jar, 20 inches deep, of 4 to 5 gallon capacity. A zinc cylinder is placed around the porous jar,  $\frac{1}{4}$  inch away, and about  $\frac{3}{4}$  inch from the inside of the copper kettle. This zinc cylinder should be 20 inches high of heavy sheet or cast zinc about  $\frac{1}{4}$  inch thick. To this must be fitted strips of flat copper  $3 \times 1\frac{1}{2}$  inches, grooved to hold the work rod, which latter should be of  $\frac{3}{8}$  to  $\frac{1}{2}$  inch diameter copper wire.

### Soft Nickel Deposit

Q.—We indicate below the nickel formula which we are now using:

Water .....	1 gallon
Nickel sulphate.....	32 ozs.
Nickel chloride.....	4 ozs.
Boric acid.....	4 ozs.

This solution gives us a hard plate. We are desirous of learning how we may obtain a soft nickel plate. If this result can not be obtained from the above solution, could you suggest a formula for a soft plate? We are using the nickel as an undercoat for chromium, and the high amperage required for chromium causes the nickel to lift.

A.—In our opinion, the nickel deposit obtained from the solution you indicate should not be hard. The nickel chloride and boric acid should ensure a soft, malleable nickel deposit, especially if the solution is heated to 110° F. It should not be affected to such an extent by a final deposit of chromium that both the nickel and the chromium peel from the basic metal surface.

The nickel plated surface should be buffed to a high lustre, cleaned with soft cloths and then chromium plated direct. Then dry without cleansing. If hydrogen occlusion is the cause of the peeling of the nickel deposit, you can control this by an addition of sodium perborate to the solution. Add  $\frac{1}{8}$  to  $\frac{1}{4}$  oz. Dissolve it in a little water at 110° F. for the solution, then add the same amount of pure muriatic acid to the solution, or sufficient to produce the same acidity in the blue litmus paper test as your nickel solution does. The nickel deposit should then hold firmly.—CHARLES H. PROCTOR.

A battery solution consisting of nine parts of common salt and one part of sal ammoniac is placed in the copper kettle, outside of the porous jar. It is important to eliminate diffusion as much as possible. To do this the specific gravity of the gilding solution is determined and the battery solution is made to conform to this. Also, the level of the battery solution outside the pot and the level of the gilding solution inside the pot must be maintained the same at the beginning and during the operation, when it becomes necessary to add water from time to time, due to evaporation, the process being carried on at a little under the boiling point.

### METHOD OF OPERATION

Articles are suspended in the gilding bath by means of a copper wire. The copper in contact with the zinc cylinder generates a slight current, the zinc being the anode and the article in the bath a cathode. It acts like a small permeable diaphragm cell. The following formula may be employed:

Water .....	1 gallon
Sodium gold cyanide.....	2 dwts.
Soda ferro cyanide.....	0.2 ozs.
Soda ash .....	2 ozs.
Soda phosphate.....	1 oz.
Soda sulfite .....	$\frac{1}{2}$ oz.

It is further advised that good contact be assured, because if the work is left in the bath for some time out of contact, the deposit will not be of a good color.—CHARLES H. PROCTOR.

### Nickel on Zinc-Aluminum Castings

Q.—We are now casting an alloy containing 94% zinc and 6% aluminum. We desire to plate it in nickel, oxidized copper, oxidized silver, copper and silver. We have tried to do this in the ordinary solutions but have encountered considerable difficulty. We would greatly appreciate any suggestions you may offer which would assist us in obtaining good results.

A.—The ordinary nickel solution is not satisfactory for plating castings which are 94% zinc and 6% aluminum. The solution best adapted for this purpose is prepared as follows:

Water .....	1 gallon
Single nickel salts .....	12 ozs.
Sal ammoniac .....	2 ozs.
Boric acid .....	2 ozs.
Epsom salts .....	12 ozs.

Buffing dirt should be removed with mild alkaline cleaners, after which the articles should be immersed in a cyanide dip, rewashed in water, then plated direct. It is customary to nickel plate the die casting before plating in copper or silver, which are afterwards to be finished in oxidized copper or oxidized silver. It may be possible to plate the die castings directly after cleaning, as outlined, if the castings are immersed in the following acid dip for from 10 to 30 seconds; the higher the zinc content of the alloy the shorter the time of immersion, possibly 5 seconds being ample.

### ACID DIP

Nitric acid .....	3 parts (liquid measure)
Hydrofluoric acid, 48% .....	1 part

After dipping, wash thoroughly and plate first with a fairly high current density.—CHARLES H. PROCTOR.

## Platers and Chemists Discuss Research

Electroplating Conference, Bureau of Standards in Washington, D. C., Friday, March 2, 1928

By ELECTROCHEMIST

WRITTEN ESPECIALLY FOR THE METAL INDUSTRY

A conference on electroplating was held at the Bureau of Standards in Washington on March 2 for the purpose of discussing the research work on electroplating which is being done at the Bureau. There were about 75 present including the officers and committees of the American Electroplaters Society and others interested in the subject.

The group was welcomed by Director Burgess who expressed his appreciation of the manner in which the industry had cooperated with the Bureau in its electroplating investigations. Dr. William Blum outlined the purposes of the conference and discussed the general aspects of the plating work done at the Bureau.

The annual expenditure for electroplating research in the Bureau laboratories is about \$26,000, three-fourths of which is contributed by the Government. The personnel turn-over presents a serious disturbance to the progress of the work. Since the average period of service is but two years, a large amount of time is required for the training of men. In compensation for this situation the Bureau is benefited by the closer contacts with the industry made through its former employees. The Bureau has the twofold purpose of serving industry and the Government. In its electroplating investigations an attempt has been made to relate the fundamental principles of electrochemistry to the practice of electroplating. The results of the work have been published in a form which is of interest both to electroplaters and electrochemists.

In summarizing the published researches of the Bureau Dr. Blum described the work on polarization, throwing power, nickel, zinc and chromium plating. The object of

studying polarization and throwing power was to find methods of measurement and to relate these phenomena to actual plating operations. The result was the Haring Box which has proved useful in the study of both of the factors.

The work in nickel plating has resulted in an appreciation of the importance of controlling the acidity of the plating bath and of limiting the impurities in nickel salts. It was found in the course of this work that the corrosion efficiency of nickel anodes is improved by the presence of about  $\frac{1}{2}\%$  of nickel oxide.

In the plating of zinc die castings it was found to be largely a question of increasing the throwing power of sulfate baths by the use of sodium or magnesium sulfates. It was the general opinion of those present that a mild pre-cleaning is superior to a strong alkali etch in preparing die castings for plating.

For the nickel plating of surfaces for electrotyping it has been found that a simple bath containing 7 ounces of nickel sulfate and 0.7 ounces of ammonium chloride to the gallon will give deposits quite as satisfactory as those obtained from more complicated solutions. The pH of this bath runs from 6.2 to 6.6.

W. P. Barrows, Electroplaters Society research associate at the Bureau of Standards, reported the progress of his work on "spotting out." This trouble appears in two forms. That variety which develops beneath the lacquer on lacquered oxidized copper finishes is due to a growth of crystalline chalcocite ( $\text{Cu}_2\text{S}$ ). Sulfur from wrapping paper, rubber bands or the atmosphere was



BUREAU OF STANDARDS ELECTROPLATING CONFERENCE AT WASHINGTON, MARCH 2, 1928

found to be the agent responsible for this action. A series of shipping and storage tests are being carried out in this investigation. It has been found that tinfoil, waxed paper, or paper dipped in a petrolatum solution show promise as a means of combating this trouble. The other type of "spotting out," sometimes known as "creeping out," results from occluded salts or from porosity of castings and it is accelerated by humid conditions. In this connection it was pointed out that black nickel finishes show little tendency to "spot out."

M. R. Thompson described his recent work on the composition and analysis of cyanides. The principal impurities in ordinary alkali cyanides used in plating baths are carbonates, cyanates and formates. Mr. Thompson has been able to prepare sodium cyanide of very high purity by liberating hydrocyanic acid and absorbing it in alkali in the absence of carbon dioxide.

H. E. Haring stressed the importance of conducting further research on overvoltage pointing out that such studies should be of considerable value in the field of chromium plating.

Recent work on thick iron deposits was reported by C. T. Thomas of the Bureau of Engraving and Printing. A bath containing 40 ounces of ferrous chloride and 45

ounces of calcium chloride per gallon operated at 90°C has given good results at current densities around 50 amperes per square foot. Armco iron anodes were used. These were separated from the cathode compartment with an alundum diaphragm. Because of its corrosiveness the bath was used in an earthenware jar. R. O. Hull gave the progress of his investigation of the use of addition agents in copper electrotyping solutions. It is desirable to make a very smooth copper deposit at current densities in the neighborhood of 300 amperes per square foot. The work has been confined to an acid bath and up to the present time an effort has been made to get a satisfactory plate without the use of addition agents.

R. J. O'Connor from the Electroplaters Society gave the report of the Research Committee of that society and opened the discussion of suggested topics for research. The question of placing a second research associate at the Bureau came up for consideration, there being sufficient funds pledged apparently to support an additional man. While some felt that additional work should be undertaken on "spotting out" it was the consensus of opinion that it would be advisable for a new associate to undertake a fundamental investigation of the principles of chromium plating.

## A List of Those Present

NAME	FIRM	ADDRESS	NAME	FIRM	ADDRESS
Abbotts, Leonard	Bridgeport Metal Goods Company	Bridgeport, Conn.	Hicks, R. E.	Yale & Towne	Stamford, Conn.
Andersen, Bjorn	Celluloid Corporation	Newark, N. J.	Hirsch, Albert	Carey, McFall Company	Philadelphia, Pa.
Anderson, E. G.	American Hardware Company	New Britain, Conn.	Hogaboom, G. B.	Hanson-Van Winkle-Munning Company	Matawan, N. J.
Barrows, W. P.	American Electroplaters' Society	Washington, D. C.	Hoke, C. M.	Hoke, Incorporated	New York City
Baulieu, W. E., Jr.	Bridgeport Brass Co.	Bridgeport, Conn.	Hough, F. Z.	U. S. Naval Gun Factory	Washington, D. C.
Beck, C. F.	Yale & Towne	Stamford, Conn.	Howells, L. T.	Cowles Detergent Company	Cleveland, O.
Bekkedahl, N.	Bureau of Standards	Washington, D. C.	Hull, R. O.	International Association of Electrotypers	Washington, D. C.
Blount, E. G.	Indiana Lamp Corporation	Connersville, Ind.	Job, Robert	Milton Hersey Company, Ltd.	Montreal, Can.
Blum, W.	Bureau of Standards	Washington, D. C.	Jones, C. E.	General Electric Company	Schenectady, N. Y.
Boutell, Hugh G.	Bureau of Standards	Washington, D. C.	Johnquest, H. M.	Chemist	Waterbury, Conn.
Brown, J. Rowland	Reliance Gauge Column Company	Cleveland, Ohio.	Johnson, R. E.	Scovill Manufacturing Company	Waterbury, Conn.
Burgess, George K.	Bureau of Standards	Washington, D. C.	Lawrence, Geo. J.	The J. B. Ford Company	Wyandotte, Mich.
Burns, R. M.	Bell Telephone Laboratories	New York City	Lawson, W. W.	Harshaw, Fuller & Goodwin Company	Philadelphia, Pa.
Clark, Austin B. J.	Bureau of Standards	Washington, D. C.	Luess, George A.	U. S. Naval Gun Factory	Washington, D. C.
Conley, Chas. C.	National Cash Register Company	Dayton, Ohio.	Mesle, F. C.	Oneida Community	Oneida, N. Y.
Cotbit, John	Westinghouse Electrical & Manufacturing Company	East Pittsburgh, Pa.	Meyer, Garson	Eastman Kodak Company	Rochester, N. Y.
Darling, H. R.	Eastman Kodak Company	Rochester, N. Y.	Moore, H. R.	Bureau of Standards	Washington, D. C.
Davis, A.	Knickerbocker Electrotype Company	New York City	Moore, J. F.	Frankford Arsenal	Philadelphia, Pa.
DeVoti, Wm.	Consolidated Safety Pin Company	Bloomfield, N. J.	Moul, H. C.	Hanover Wire Cloth Company	Hanover, Pa.
Dimon, Richard A.	Scovill Manufacturing Company	Waterbury, Conn.	Mullen, John, Jr.	Superior Metal Company	Bethlehem, Pa.
Eddy, George E.	Lockwood Manufacturing Company	So. Norwalk, Conn.	McComas, Clarence B.	Carr-Lowrey Glass Company	Baltimore, Md.
Elwin, Tennant	Connecticut Telephone & Electric Co.	Meriden, Conn.	McCrumb, F. R.	LaMotte Chemical Products Company	Baltimore, Md.
Faint, Edward W. T.	International Motor Company	Allentown, Pa.	McElroy, Charles J.	Bridgeport Metal Goods Manufacturing Company	Bridgeport, Conn.
Fraine, W.	National Cash Register Company	Dayton, O.	McGar, B. H.	Chase Company, Inc.	Waterbury, Conn.
Fraser, O. B. J.	International Nickel Company	Bayonne, N. J.	O'Connor, R. J.	Contract Plating Company	Bridgeport, Conn.
Gillett, H. W.	Bureau of Standards	Washington, D. C.	Oswald, F. G.	General Electric Company	Pittsfield, Mass.
Gottsmann, John A.	John A. Gottsman & Company	Washington, D. C.	Parker, H. C.	Leeds and Northrup Company	Philadelphia, Pa.
Haring, H. E.	Victor Talking Machine Company	Camden, N. J.	Perry, J. S.	Eastman Kodak Company	Rochester, N. Y.
Harris, Chas. W.	Universal Plating Company	Washington, D. C.	Peter, Herman	Lustro Coated Sheet Company	Pittsburgh, Pa.
Heallis, E. J.	U. S. Naval Gun Factory	Washington, D. C.	Phillips, W. M.	General Motors Corporation	Detroit, Mich.
Hedden, S. E.	Enameled Metals Company	Etna, Pa.	Pierdon, F. F.	Art Metal Finishing Company	Washington, D. C.
Herzog, G. K.	Union Carbide & Carbon Research Laboratories	New York City	Pitschner, K.	American Chain Company	Bridgeport, Conn.
			Proctor, Charles H.	Roessler & Hasslacher Chemical Company	Arlington, N. J.
			Renfro, George E.	Bureau of Standards	Washington, D. C.
			Robson, A. M.	Reynolds-Robson Supply Company	Philadelphia, Pa.

NAME	FIRM	ADDRESS
Scherrer, W. P.,	U. S. Naval Gun Factory,	Washington, D. C.
Schwartz, Andrew,	U. S. Naval Gun Factory,	Washington, D. C.
Scobb, W. M.,	Frankford Arsenal,	Philadelphia, Pa.
Servis, O. E.,	Felt & Tarrant Company,	Chicago, Ill.
Shea, Dennis C.,	Standard Oil,	Elizabeth N. J.
Sievering, Philip,	Philip Sievering, Inc.,	New York City.
Sizelove, O. J.,	August Goertz Company,	Newark, N. J.
Slattery, Thos. F.,	Bureau of Engraving & Printing,	Washington, D. C.
Smith, Horace H.,	Tiffany & Company,	Newark, N. J.
Sohn, Erwin,	Standard Sanitary Manufacturing Company,	Pittsburgh, Pa.
Suhl, R. L.,	International Nickel Company,	New York City.
Taylor, Floyd T.,	Hanson-Van Winkle-Munning Company,	Matawan, N. J.
Taylor, W. A.,	LaMotte Chemical Products Company,	Baltimore, Md.

NAME	FIRM	ADDRESS
Thomas, C. T.,	Bureau of Engraving & Printing,	Washington, D. C.
Thompson, M. R.,	Bureau of Standards,	Washington, D. C.
Tschantre, H.,	Universal Plating Company,	Washington, D. C.
Van Derau, C.,	Westinghouse Electric Company,	Mansfield, Ohio.
Wagaman, James W.,	Mitchell Binder Company,	Hagerstown, Md.
Wagaman, S. M.,	W. F. Prior Company, Inc.,	Hagerstown, Md.
Washburn, E. W.,	Bureau of Standards,	Washington, D. C.
Wehmhoff, B. L.,	Government Printing Office,	Washington, D. C.
Welsh, W. E.,	Knickerbocker Electrotype Company,	New York City.
Westbrook, L. R.,	Grasselli Chemical Company,	Cleveland, O.
Williams, Fred H.,	Canadian National Railways,	Montreal, P. Q.
Willmore, H. G.,	Crown Rheostat & Supply Company,	Chicago, Ill.
Zadowoski, N. E.,	Peck, Stow & Wilcox Company,	Cleveland, O.

## Buffing Brass Strip

Q.—We are polishing 26 gauge brass strips 75 ft. long and 1 in. wide, but not to our satisfaction, so we are asking your advice in the matter. At present we are using two electric motors with buffers on the ends of both. When we start the strip under the buffers, the motors must be running in a clockwise direction and when we get almost to the end we must stop the motors and reverse them so that the buffers don't throw the strip of brass five or ten feet down the room. This is a very slow way and a very unhandy way of polishing, and we would like you to tell us how to speed it up.

A.—The brass strips probably come to you coiled up and if this is the case you might slip the innermost end out of the coil and punch a hole in it and do the same thing with the outer end. You will then be able to lace two coils together and having finished one coil, attach a third coil to the second one and so on until the job is finished. Use common soft iron wire for lacing.

It may be necessary to punch two holes instead of one so that the metal will be guided properly and held in place. I would suggest that the metal be rolled on a spool

as it is buffed. The shaft of the spool should have a squared, raise part in the center to hold the spool from turning on the shaft. The shaft should have a squared end also for the use of a hand crank to pull the metal through while buffing.

The metal should pass over a table while buffing and care must be used to see that the crank is held firmly as the buff will pull the metal. The crank could be made with four handles set into the hub forming a turnstile which would be safer than one handle. The winding spools may be made of lumber thick enough to allow the metal to coil easily and they may have side pieces to keep the metal in place if necessary. A section may be cut out of the spool to fasten the beginning of the coil and a wedge used to hold the metal in place. When the coil is large enough, the wedge is driven out and the spool is detached from the coil without unwinding.

An automatic device could be designed for this work but we think with the suggestions made above you will have no serious difficulty in handling the situation.—W. L. ABATE.

## Colonial Brass and Silver

Q.—Can you tell us the best method to obtain a Colonial Brass or Colonial Silver finish on brass fixture parts?

A.—The usual procedure in producing Colonial finishes on brass and silver plate is as follows:

### COLONIAL BRASS

If the articles are made of brass they should be cut down with Tripoli composition, then cleansed with either benzine or gasoline, or with hot alkaline cleaners. Next, scratch-brush evenly with crimped steel wire scratch-brushes run at a speed of not more than 500 revolutions per minute. The abrasive to produce the semi-lustre finish is very finely ground pumice stone mixed with water and bicarbonate of soda, about 4 ozs. per gallon of water. Some cheap wheat flour may be mixed with the pumice stone to keep it in a plastic condition; otherwise the pumice stone will settle out.

After the finish is produced, wash thoroughly and immerse in a dilute sodium cyanide dip: water 1 gallon, sodium cyanide, 96-98%, 4 ozs. This will remove any stains from the articles. Rewash in cold water, dry out carefully and lacquer with a brush brass lacquer, preferably by spraying.

### COLONIAL SILVER

The Colonial Silver finish is produced by similar methods before and after silver plating, followed by lacquering. Some firms, however, produce the finish by the aid of Colonial Finish compound which is prepared from tallow and flour pumice or silica. Either steel, bristle, or slow running cloth brushes are used. After the finishes are produced by the latter method they must be cleansed carefully with gasoline or benzine and dried out with very fine boxwood or hard wood (maple) saw dust. This is followed by the customary lacquering to protect the finish.—CHARLES H. PROCTOR.

### Error

On page 139 of our March issue, we stated that when the National Research Council was functioning, S. Skowronski of the Raritan Copper Works was the secretary of its Selenium-Tellurium Committee. This was obviously an error. The National Council is still functioning. It is Selenium-Tellurium Committee which has been disbanded.

## Silver on Glass Door Knobs

Solutions and Methods for Coating the Insides of Glass Knobs Used in Connection with Builders' Hardware

By CHARLES H. PROCTOR

Plating-Chemical Editor

Glass knobs are manufactured in several sizes by glass manufacturers, and the insides of the knobs are designed so that a rosette or many pointed star results in each. The rosette or star is silvered under procedure and methods similar to those used in silvering of glass mirrors. The silver deposit which results is equal in lustre to the glass and adds lustre and reflection.

Glass knobs are usually made from leaded glass, so that quite frequently there remains an almost invisible film of lead oxide upon the surface of the glass. This quite frequently prevents a successful silver deposit. Therefore, all glass knobs must be perfectly clean before silvering. It is advisable to immerse them in nitric acid, 38°, undiluted, for a moment or two. The nitric acid will dissolve the lead oxide and leave a clean surface. The knobs should be washed thoroughly in clean water and dried carefully. They are then ready for the silvering operation.

Aluminum wire baskets can be used to advantage in cleansing the glass knobs. Nitric acid has no dissolving action upon pure aluminum, but such baskets must not be immersed in other acid or alkaline cleaners.

Procedure in silvering is as follows:

### SILVERING STOCK SOLUTION

C. P. silver nitrate.....	3 ozs.
Aqua ammonia 26°.....	2 ozs.
Distilled water .....	20 fluid ozs.

To prepare the solution, heat 10 ozs. of the water to 140° F., dissolve the silver nitrate therein, add the balance of the water, cool down to normal, then add the ammonia slowly with constant stirring. Finally, filter the solution.

### REDUCING SOLUTION

Distilled water .....	5 fluid ozs.
Tartaric acid crystals.....	1 oz.

### SENSITIZING SOLUTION (stock)

Distilled water .....	10 ozs.
Tin chloride .....	1/8 oz.

### OPERATING SILVERING SOLUTION

Distilled water .....	16 ozs.
Stock solution .....	1 1/2 fluid ozs.
Reducing solution .....	1/8 fluid oz.

### MANIPULATION

The operating silver solution should be thoroughly stirred with a glass rod and kept in a dark-colored bottle at all times. As a stopper use a cork with a glass tube insert extending evenly with the cork inside the bottle; the outside of the tube should be about four inches long and drawn to a point like a fountain pen filler.

The glass knobs after the preliminary cleansing should be passed through the sensitizing solution prepared as follows:

Distilled water .....	1 gallon
Sensitizing solution .....	60 drops

Mix the solution thoroughly.

Lay the knobs upright in a box-like frame which may be filled with either sawdust or sand to support the knobs. If a steam table can be rigged up it is advisable to do so, because a small amount of heat that will pass to the sawdust or sand will help to facilitate the precipitation of the silver from its solution to the glass knob.

The knobs are now ready to receive the silvering solution. Fill them sufficiently so that the silver will precipitate to the depth required. In a few minutes the glass will be coated with silver if a small amount of heat is used as outlined.

When the silvering operation is completed, pour the silvering solution from the knobs back into a reserve bottle. It will contain some silver which should be recovered. The silvering solution cannot as a rule be used a second time, but the operator can make a trial. The knobs after silvering should be drained very thoroughly and washed in water with the utmost care, then dried. Finally, lacquer the inside of the knob with a diluted celluloid lacquer just sufficiently to prevent the silver from tarnishing and the operation is ended.

## Use of Cadmium in Acid

Q.—Will you kindly tell me how to precipitate cadmium from muriatic acid so it can be used to brighten a nickel solution or to put back in a cadmium solution? I strip racks and wire used in plating cadmium and thought I could make use of the cadmium, instead of throwing the acid away.

What is cadmium oxide, and how is it made? What is the metal content of oxide or chloride of cadmium?

A.—It is not necessary to precipitate the cadmium from a muriatic acid solution to use it as a brightener for nickel deposits. When cadmium metal is dissolved in muriatic acid to the point where the acid will dissolve no more, a saturate solution of cadmium chloride results. This can be used as a brightening agent for nickel solutions on the basis of one ounce of the cadmium solution to 100 gallons of nickel solution.

It must be understood that if any copper enters and contaminates the cadmium solution so prepared, it is worthless as a brightener for nickel solutions. The very smallest amount of copper in it will almost certainly result in black streaks.

The cadmium solution could be used as an addition to a regular solution by dissolving it in sodium cyanide. It must be ascertained, however, that the cadmium solution is not acid in its reaction to blue litmus paper. If the paper turns red it indicates acid. You could add a small amount of carbonate of soda to neutralize the free acid before dissolving the solution in sodium cyanide. This would obviate the danger of hydrocyanic gas evolution.

Cadmium oxide contains 86% metallic cadmium.

Cadmium chloride contains about 46% in the salt form.—CHARLES H. PROCTOR.

# Sales Ethics From a Purchasing Agent's Viewpoint

How the Salesman Appears to the Man at the Desk. From a Paper Read at the Meeting of the International Fellowship Club, February 18, 1928

By F. G. SPACE

Purchasing Agent, The Seymour Manufacturing Company

THIS IS THE FIRST PRINTED PUBLICATION OF THIS ARTICLE

This word "ethics" is tantalizing when applied to business, more particularly to buying and selling. It is like dangling a carrot a few inches in front of the donkey's nose. It keeps him coming but he cannot quite reach it. It is somewhat intangible and difficult to define satisfactorily. It plays a dual role, for what may seem ethical to one may not appear so to another.

Men of all ages, in all walks of life, have had what they called a code of ethics. An upright man subscribes to a code of ethics that becomes a part of his religion. He considers it as unethical to be a non-voter and shirk his duty as a citizen, as he does to fail to support his church in its crusade to make this world a better place in which to live and bring up his children. He recognizes it as unethical to parade as a generous contributor to worthy causes and at the same time derive revenue from property which he may rent for immoral purposes. In other words he is consistent in his concept of morality and duty.

At one of our purchasing agents' meetings a few weeks ago I tried to tell why I believed that the average buyer was human, contrary impressions notwithstanding. The more I have pondered over that thought, which at first I had considered only semi-seriously, the more I believe that it provides the common ground on which we may all meet, for we all have our share of the human frailties. Our job is to buy right, with all that the expression implies, and in turn, the salesman's job, divested of all its frills and furbelows, is to sell goods. He may first be obliged to sell himself, then his company, and then its service before he can sell his goods but, basically, that is his job as I conceive it.

Please pardon a personal reference, but I thoroughly enjoy my work. While the position of purchasing agent is far from being the most remunerative, it nevertheless is one of the most interesting that industry offers and, within given limits, it may be made as important as the purchasing agent's vision of its possibilities will permit. Now, if a third of my time is devoted to interviewing salesmen I submit that this is evidence that I hold the selling fraternity in high regard, otherwise I could not thoroughly enjoy my work. The purchasing agent and the salesman should meet as man to man and not as one man entrenched behind his desk, with a poker face and an Arctic aurora about his head, and the other as just one more of those peddlers. But get this, gentlemen: ours is not an easy task. We must constantly sift the chaff from the wheat. We are preyed upon by unscrupulous salesmen who would like us to buy their files or foreign tool steel and who are so clever that should they obtain an order you may find yourself obligated to four times as much as you thought you were buying. Again, some bright morning you may find a most convincingly worded letter on your desk to the effect that two bales of wiping cloth, for instance, are at your nearest railroad station, consigned in error, and that if you can accept them a saving of a few cents a pound is offered and then, when we meet a group of our brother purchasing agents, should the matter be mentioned ten to one we find that many of them, too, have been offered the benefit of a purchase under a like coincidence.

Many salesmen do not consider whether it is good business to sell you something you do not want or do not need. They approach you with the main idea of obtaining an order. Is it strange, therefore, that we have built up a reputation for being cold-blooded and hard-boiled, of being narrow minded and prejudiced, of being traders and trimmers. Why we are even accused of holding back prosperity and, if in our endeavor to buy right, we should break the market, we are then accused of creating discord and suspicion in a given line of business. I heard one buyer remark that he hardly dared to evidence more than a surface cordiality in his reception of salesmen, for otherwise they would interpret his friendliness as an invitation to visit for a half hour when he simply could not spare the time. This may appear to you as somewhat far-fetched, but it is true that there are some men who call upon us whom we may like personally but rather dread to see during business hours, because brevity is not on their calendar and we, of course, should not permit ourselves to be ungracious to them.

I would like to make some suggestions to salesmen, although I may be treading on very thin ice. Be happy in your approach—a smile is contagious and it is also disarming.

If you find that your prospect does not use any of your material do not persist in telling your entire sales story when it is obvious that there is no market. Do not overwhelm the buyer with your superior knowledge of your product. It may create a mental barrier. In your search for the buyer's hobby do not touch on everything from golf to politics. You may be wasting a precious opportunity. Try to eliminate the use of such words as "best" and "perfect" or secret formulas or statements that call for the superlative. They may be true as gospel but we are so bombarded by them that unconsciously the buyer may find himself in an argumentative mood. Do not go around to the back door in an endeavor to first cultivate the superintendent or the plant engineer or the general foreman. If you do not feel that you are getting a square deal have it out with the purchasing agent and, if that is not satisfactory, bide your time a bit, for the chances are that you will find a new man on that job ere long.

I have a friend who is the head buyer for a large public utility. He has said that one of his assistants told him of a salesman who was calling regularly once or twice each week and not once did he offer a business proposition. His main purpose seemed to be entirely submerged in the social aspect of his visit. Now, the head buyer made it a point to see this gentleman and told him frankly but firmly, that unless he had something worth while to offer it would hardly be necessary for him to continue his calls. It is a safe estimate that not more than 30 per cent of the salesmen who call on the average industrial concern present propositions that are of value to your company.

The salesman is necessary. The salesman is a pioneer and a pathfinder of business. He forms the vanguard of business in its progressive march. He is a vital part of business. But as to the future, far be it for me to prophesy. The vice-president of your Bankers Trust

Company has made the statement that the coming decade will witness the passing of the traveling salesman as an important factor in the country's economic life. He believes that the steady growth of scientific management in big business will be responsible. I have read that advertising was reducing his ranks, as well as chain stores and mail order houses; the growing use of the telephone in business, centralized buying, etc. As regards the latter I do know that mass production calls for mass purchasing. The printed page may tell a story but I have observed that when there is important business in sight it's a salesman who goes after it. This may be a material and a mechanical age in which we are living, but nevertheless character and ability have never been in greater demand or at such a premium. If business were to be reduced to the level of a machine I predict that it would prove a juggernaut and be destructive rather than constructive. You cannot eliminate the humanities and expect ethics in business to survive. In the fifteen years which it has been my privilege to be on the swivel chair side of the desk I have been distinctly conscious of the increasingly high standards of the salesmen whom I meet. But I believe that the future, with its changing customs and new demands, will call for even more expertly trained men. Also, during that period I have had opportunity to mingle with purchasing agents and I believe that they also average better men. As to their future, it is the survival of the

fittest for more and more industry demands college men.

I believe that the purchasing agent leans backward when it comes to receiving rather than not deceiving a salesman. The good will of the vendor and ordinary business courtesy demands that the least we can do is to give the salesman who is calling upon us a chance to show his wares. Your work as a salesman is fundamentally educational and it is entirely in order that the buyer should recognize that fact. Furthermore, to my mind it lifts the business of selling to a higher level of conduct or ethics, if you choose to call it that. Few purchasing agents have the intimate knowledge of a given commodity that the salesman has and the reason therefor is quite obvious. He buys a multitude of items, and unless it is a major commodity with him, the chances are that the buyer's knowledge is comparatively superficial.

I contend that ethics means infinitely more than the questions should the salesman offer the buyer a cigar, or should he take the buyer to dinner at his expense, or should he send the purchasing agent a box of candy for the kiddies at Christmas. These are matters which each salesman and purchasing agent, if either is big enough for his job, should be able to settle for himself. But the way we conduct ourselves, our aims, our motives, our purposes—these are important. If ethics has to do with the principles of human morality and duty, then that is the aspect of our endeavor which is indeed vital.

## Preventing Brittleness and Stains in Nickel

Q.—We are having considerable trouble with dark stains on our nickel plated work. Peeling plate is also a source of annoyance to us. We have been plating on brass composed of 66 copper and 34 zinc and also on brass made with phosphor bronze clips. On either of these mixtures has the nickel plate been entirely satisfactory at all times, the stains and peeling occurring frequently. Our plating solution is taken from "Platers' Wrinkles" and is composed as follows:

Water .....	1 gallon
Single nickel salts .....	8 ozs.
Boracic acid .....	1 oz.
Sodium chloride .....	½ oz.
Epsom salts .....	1 oz.

We are using a Munning tank of 280 gallon capacity, with two plating barrels and are plating approximately 4,000 small pieces of brass at a time,—2,000 in each barrel. We have three ½ in. x 9 in. cadmium sticks in the solution constantly. Now, do you suppose that sodium perborate in the solution would help? What effect has that on nickel solution? Do you think that our trouble is an excess of cadmium? Is it possible to have too much cadmium and what would an excess of it result in?

A.—When cadmium metal sticks are used in a nickel solution to produce bright nickel deposits, it is necessary to maintain the solution at a little higher acidity, preferably with pure muriatic acid, or else stains are liable to occur on the nickel plated surfaces, or the deposit may become brittle and peel. This has probably occurred in your case. Try adding at least ⅛ oz. of muriatic acid per gallon of solution every day it is used. Remove the cadmium sticks when the solution is not in operation.

Sodium perborate is a valuable addition agent when the nickel peeling is due to hydrogen. Addition of ⅛ oz. per gallon of solution will usually eliminate the peeling in such cases. To add, dissolve the sodium perborate in warm water and add to it an equal amount of muriatic

acid, liquid measure. Mix the solution so prepared very thoroughly into the nickel solution, preferably at the close of the day's work.

Many platers now find an advantage in increasing the epsom salt content of nickel solutions to 12 ozs. per gallon. This addition brings out a much brighter and more malleable deposit, and it might be advisable for the inquirer to try this out—CHARLES H. PROCTOR.

## Chromium Chloride Solution

The following solutions have been recommended for chromium plating. It has been stated that higher throwing power is obtainable than with the sulphate solution.

Water .....	1 gallon
Chromic chloride .....	3 pounds
Hydrochloric acid, just enough to clear up the solution.	

Water .....	1 gallon
Chromic chloride .....	24 ounces
Potassium chloride .....	16 ounces
Temperature, normal; voltage, 4 to 5; amperage, 40 to 50 per square foot of surface area of the work.—	
CHARLES H. PROCTOR.	

## White Silver Strike

On page 125 of our March issue we published a formula for a strike solution consisting of

Water .....	1 gallon
Silver Cyanide .....	⅓ ounce
Caustic potash .....	½ ounce
There should be added to this solution, 8 ounces of sodium cyanide which was inadvertently omitted from the formula as published.	

# THE METAL INDUSTRY

With Which Are Incorporated

**THE ALUMINUM WORLD, COPPER and BRASS, THE BRASS FOUNDER and FINISHER  
THE ELECTRO-PLATERS' REVIEW**

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# Editorial

## Ag'in' the Gov'ment

A new tempest has arisen in an old teapot. The American Institute of Weights and Measures in a circular letter has asked whether a new bill now in committee of the House of Representatives is intended to give to the Bureau of Standards control of all gauges and micrometers. The Bureau of Standards answers emphatically "No." (See this correspondence in full on page 174 of this issue.)

In back of this seemingly academic discussion is the old bugbear of the metric system. Those who object to the adoption of this system have a fear that scientific institutions like the Bureau of Standards are attempting in every underhand way to force the use of the metric system on the American public.

We have no intention at this time of discussing the metric system, its advantages or disadvantages, theoretical or practical, or the cost of replacing our present scale of weights and measures with metrics. We confess that we are prejudiced to the extent of believing that the Bureau of Standards is working for industry and not against it, and consequently would not attempt to "put over" any ideas contrary to any well founded beliefs of industrial America.

What amuses us is the attitude of (we believe) a few that nothing that the Government may do is right. They are always "ag'in' the Gov'ment." If it is Government it is politics and, if it is politics, of course, it is rotten. Hence, if it is Government it is rotten. Quite simple. Witness the following:

"Life is too damned short to let some fellow who has no other qualification than brass buttons pass judgment upon our deliveries of leather."

This in response to a request that a certain leather company bid on Government work under the Government specifications which had been issued.

"... that the Bureau of Standards has much to learn before it can be accepted as a competent body on the standardization of things is believed by a very substantial number, if not the majority, of the people."

This is from a house organ, speaking "authoritatively" for the people at large.

"What the Bureau of Standards does not seem to have intelligence to comprehend is that when it is impractical to standardize a thing without doing more public harm than good, it is the duty of the Bureau not to standardize that thing."

What a stupid, obstinate collection of nobodies the Bureau must be!

"The merchant who dogmatically demands that all sellers shall submit to his dictatorial terms of purchase is a merchant who is doomed to failure for he is lacking in merchandizing intelligence."

As for example, the General Electric Company, the Westinghouse Electric and Manufacturing Company, the United States Steel Corporation, the General Motors Corporation, the Scovill Manufacturing Company, the Anaconda Copper Mining Company and a few other decrepit organizations who are about to fall into the hands of the receiver because they believe in purchasing their materials on specification.

"The purchase of commodities for the United States Government is a business proposition and not a scientific problem."

Thereby meaning that business is not scientific? And also that purchasers must buy what the sellers give them, regardless of what they want?

These quotations could be extended almost without limit, but both life and space are too short. Our only suggestion to such disgruntled people is to sweep the

chips off their shoulders, buckle down to business and supply the materials which the customer wants, whether that customer be an individual, a corporation or the Government. This has been found to be the best rule for success in merchandising.

## Platers Confer with Chemists

The recent conference on electroplating held at the Bureau of Standards, March 2, 1928 (reported in full on page 165 of this issue), typifies the interest of the industrial world in plating problems, and the attitude of the electroplater of to-day toward the Bureau of Standards and industrial chemists. The conference was for the purpose of discussing the research on electroplating problems now in progress at the Bureau of Standards. These problems include spotting out, the composition and analysis of cyanides, over-voltage, iron deposition, and addition agents in copper electrotype solutions. Reports were presented by the men in charge of these special problems. In another session, subjects for future research were discussed, including chromium plating, pitted nickel plate, the measurement of pH by various methods and the relation of nickel plating to subsequently applied chromium plating.

All of these subjects are of vital importance to the commercial electroplating industry. The old-time plater would have looked at the titles and sneered, "That is all theory." But times have changed. The plater has learned to use the comparator to determine the pH of nickel solutions. He has learned the value of analysis to enable him to keep his solution up to proper concentration. He knows that agitation and filtration keep the solution uniform and clean. He knows that high grade nickel anodes are better than the old 92 per cent grade, and a host of other points of information which sound like little things to-day, but are the results of conscientious and painstaking research.

In the main, the industry has its troubles to thank for this new attitude. If the road had been smooth and without stumbling blocks there would have been no pressure for progress. Necessity is the mother of many inventions and not the least of these are the new devices and methods developed for electroplating metals.

## Progress of the British Institute

The report of the Council of the British Institute of Metals is too important a document to pass unnoticed. A report of the meeting will be found on page 159 of this issue, together with abstracts of the papers presented. We wish here, however, to touch upon the uninterrupted growth of this body of metallurgists.

The British Institute of Metals had 1903 members on December 31, 1927. On December 31, 1923, it had 1532 members, and the progress between those dates has been steady. Part of this increase is due to the comparative ease with which metallurgists can meet in Great Britain. The distances are short and the expenses of these meetings are comparatively small. On the other hand, it is unquestioned that the British Government and manufacturers are vitally interested in their Institute. By their sympathetic attitude, if not by actual cash contributions, they have done much to aid its uninterrupted growth. It is noteworthy that the overseas membership is also growing rapidly. The financial condition is strong, particularly for a small independent body.

It is interesting, however, to see that the same question arises in the British Institute as in the American Institute of Metals, namely, the "conflict" between the practical man and the scientist. The British Institute leans heavily toward the laboratory, the bulk of its work being with the constitution of alloys, metallography and equilibrium diagrams. The incoming president, Dr. Rosenhain, mentioned this question in his presidential address. He pointed out that the information furnished by microstructure and these dreaded equilibrium diagrams was indispensable in determining the properties of alloys and the practical applications to which they could be put. Of course, he was unquestionably right.

The problem will be settled by making the practical man acquainted with the scientific nomenclature and perhaps accompanying the more involved papers with simple descriptions of the practical applications. There is a common ground for metallurgists and metal workers, namely, the uses and methods of working metals, and it is toward this common ground that work done by both types of men should point.

### Send the Plater to the Convention

It may seem a little early to speak now of the coming convention of the American Electroplaters' Society, in Toronto, June 25-29. But it is never too early to make proper preparations, and for that reason this homily is directed to those manufacturers who have plating plants and responsible men in charge.

All of the branches of the American Electroplaters' Society send delegates at the expense of the branches, but only a limited number can be cared for in this fashion. There are hundreds of members who would like to go and who should go, but who are prevented by the cost in time and money.

A trip across the country in these days of high railroad fares is an expensive matter for the individual, and, as everyone knows, few platers pay income taxes in the higher brackets. For the company, however, it is a different matter. The company thinks nothing of sending a salesman half way across the country to follow a lead which may be worthless. The progressive organization will appropriate thousands of dollars to replace equipment which has become obsolete. Similarly, these companies should feel that their knowledge and methods are likely to become obsolete and must be replaced. How is this to be done? From books? Yes; but books are necessarily a year or more behind the times. From the technical journals? Yes; but these journals cannot publish everything as their space is limited. The last word can be obtained only from meetings where the men see each other face to face, throw questions at each other, and exchange answers.

The art of plating, now rapidly becoming a science, is moving at higher speed than ever before in its history. It demands the keenest and most wide-awake exponents to keep up with it. Nowhere can such fresh and unbiased information be obtained as from the men themselves, who have no axes to grind and who look for nothing but results.

Only the suspicious executive fears that his foreman or superintendent will waste his time at the convention. Men begin their meetings at 8 A. M., continue until 12, begin at 1:30, going on until 6, come again in the evenings and sit from 8 until 10 or 11 P.M. This is hardly a vacation or a pleasure jaunt. It is hard, serious work, more tiring than almost any other, and not a party in any sense of the word. The lunches and dinners are social in nature, but anyone who has attended them knows that the talk is 90 per cent "shop."

We urge executives, as we have urged them every year, to send their responsible men to the convention. A word picked up here and there, a new idea, a new formula, a new "hunch," may be invaluable. Replace your obsolete knowledge with new and fresh information. It is just as important as up-to-date equipment.

### Evaluating Secondary Metals

Those who were present at the meeting of the Institute of Metals Division in February and who attended the symposium on secondary metals were impressed with the great problem of that industry. Methods of recovery are being worked out steadily. Equipment is fairly well standardized and offers no unusual difficulties to the experienced operator. But the most important stumbling block is the question on determining the value of the materials involved when purchasing them.

Scrap metals are almost always inconvenient to handle and difficult to sample. They are picked up to a great extent by local dealers who accumulate large lots from scattered sources and then ship these alloys to the smelter. A carload may contain a number of different kinds of drosses, scrap and castings. Each lot may be small and entirely different from the others. In precious metal sweeps, particularly, the lots are exceedingly small and very high in value. The small lots of scrap are evaluated by eye. Large accumulations are checked by grab samples judiciously taken. Carload shipments are, of course, sold entirely on analysis.

Although chemical analysis or fire assay are the only safe methods of judging the value of a shipment, they have their drawbacks. These analyses are expensive. If a lot of material is worth \$50 to \$100, the expense of analysis is an item which makes both the buyer and seller pause and very often decide to bargain on what the material is worth, without analysis. It is rough and inevitably inaccurate, but they both prefer to gamble rather than to take a sure loss.

Modern ore sampling methods are rarely applicable to scrap. Metallic scrap must be picked by hand and a sample lot, preferably a large one, melted to determine the value. Drosses, almost always contain large lumps clotted with metal which change the whole character of the shipment. Sweeps may contain spots with very high or low metallic values, often impossible to judge.

In the old days the buyer of scrap metals had everything his own way. The sellers were not familiar with the market for their wares and were, in many cases, glad to get rid of the "waste" at any price. But now, when the secondary metal industry reached a total for 1926 of almost \$275,000,000 for the common metals alone, the knowledge of the value of scrap is common property. Sellers call for bids and sell to the very best advantage. Prices are published and only the amateur will sell below market value. Consequently, purchase of such materials is now attended with a degree of risk which was never present before and only the shrewdest and the most experienced can show profits. So much buying is still necessarily done by eye, or, as some in the trade put it, "by guess or by God," that every purchase is a gamble; and with correspondingly high losses and winnings.

The perfect solution to this situation is not in existence and may never come, but certainly the trade is awake as never before to the need for correct and economical methods of sampling which will eliminate as far as possible, the element of chance from this business and put it into the class of legitimate profit-making manufacturing, where it belongs.

## Correspondence and Discussion

Although we cordially invite criticisms and expressions of opinion in these columns, THE METAL INDUSTRY assumes no responsibility for statements made therein.

### Is the Bureau of Standards Seeking Control of All Gages and Micrometers?

To the Editor of THE METAL INDUSTRY:

A Bill (H.R. 7208) to empower the Bureau of Standards to approve or disapprove all weighing and measuring devices or mechanisms used in the country is in the hands of the House Committee on Coinage, Weights and Measures. The Bill is apparently being put forward by scale manufacturers and by local weights and measures officials, and is perhaps intended to apply to weighing scales and similar apparatus. But there is nothing in the Bill which excludes mechanics' rules, micrometers, gages, boiler pressure or blood pressure gages, radio battery testers, automobile speedometers, gasoline gages, tailors' measures, electric meters, gas meters, water meters, taximeters, pedometers, exposure meters, protractors, ship sounding apparatus, calorimeters, pyrometers, hydrometers, hygrometers, and wave meters, or in fact which specifically excludes anything at all. For that reason the American Institute of Weights and Measures, 115 Broadway, New York, an independent organization having a wide membership of manufacturers and distributors, recommends that everyone using any nature of measuring device takes steps to inform himself regarding the provisions of this Bill, and seek information from Washington, as to the time and place of hearings. None disputes the ambitions of the officials of the Bureau of Standards to prevent fraudulent application of the weights and measures standards in universal use throughout the country, but everyone is interested in what the Bureau has in mind in seeking authority to police every conceivable kind of device we use for producing articles dimensioned in terms of the standards of weight and measure.

AMERICAN INSTITUTE OF WEIGHTS AND MEASURES,  
New York, N. Y.  
February 16, 1928.

By WILLIAM E. BULLOCK, Secretary.

rules, micrometers, gages, boiler pressure or blood pressure gages, radio battery testers, automobile speedometers, gasoline gages, tailors' measures, electric meters, gas meters, water meters, taximeters, pedometers, exposure meters, protractors, ship sounding apparatus, calorimeters, pyrometers, hydrometers, hygrometers, and wave meters, or, in fact, which specifically excludes anything at all" is ridiculous absolutely contrary to fact. The same language characterizes that used at a later point as to "what the Bureau has in mind in seeking authority to police every conceivable kind of device we use for producing articles dimensioned in terms of the standards of weight and measure."

This bill was introduced by Mr. Tilson at the request of a committee of the National Conference on Weights and Measures, a body composed of State and local officials enforcing weights and measures laws. The committee was appointed as the result of a resolution passed by this conference expressing the desire of the Conference to secure Federal approval of type of apparatus for use in the buying or selling of commodities, apparatus which is under their official control. It seems to us that the bill as drawn is well calculated to secure the purpose intended, namely, to regulate devices which are charged with a public interest. This proposition has also been endorsed in the past by the Scale and Balance Manufacturers' Association and has been supported by the majority of manufacturers of devices intended to be included within the scope of the bill.

UNITED STATES BUREAU OF STANDARDS  
Washington, D. C.  
February 27, 1928.

By GEORGE K. BURGESS, Director.

### Beryllium Deposition

To the Editor of THE METAL INDUSTRY:

Your January issue includes an interesting note with respect to beryllium metal. Regrettably, the wording is such as to leave the impression that beryllium can be electrodeposited in the usual way—that is, from water solution. May I point out that this impression is unwarranted, beryllium resembling aluminum and magnesium in being too high in the electromotive series to be deposited from aqueous solution? The metal is at present obtained either by chemical reduction or by electrolysis of fused salts.

Cleveland, Ohio.  
February 14, 1928.

MENAHM MERLUB-SOBEI.

### Pouring 60-40 Alloy

To the Editor of THE METAL INDUSTRY:

My best thanks for your answer concerning the pouring of a 60-40 alloy. We poured at a higher temperature and succeeded in escaping most of our trouble.

Chicago, Ill.  
March 1, 1928.

LEON KROLL.

### Government Publications

**Elimination of Waste in Metal and Fiber Flash-light Cases.** Simplified Practice Recommendation No. 68. United States Bureau of Standards, Washington, D. C. Obtainable from Government Printing Office, Washington, D. C., for 5 cents.

**Mercury in 1926.** By J. W. Furness, Bureau of Mines, United States Department of Commerce. 16 pages covering a chapter of mineral Resources of the United States. Price, 5 cents, from Government Printing Office.

**Zinc in 1926.** By A. Stoll and J. A. Stader, Bureau of Mines. Similar to pamphlet described in previous chapter, containing 21 pages. Price, 5 cents.

To the Editor of THE METAL INDUSTRY:

Your letter of February 20, 1928, enclosing a memorandum dated February 16, 1928, on the letterhead of the American Institute of Weights and Measures and over the typed signature of W. E. Bullock, Secretary, and entitled "Is Bureau of Standards Seeking Control of All Gages and Micrometers?", has been received. The answer to the question contained in the title is emphatically "No."

The bill mentioned in the memorandum, namely, H. R. 7208, is entitled: A Bill to Regulate and Control the Manufacture, Sale, and Use of Weights and Measures and Weighing and Measuring Devices for Use or Used in Trade or Commerce and for Other Purposes. Throughout its text all the provisions of the bill are limited to apply to weights and measures "used in trade or commerce." The definition of this term is contained in Sec. 1 (d) as follows:

"The term 'use in trade or commerce' shall be construed to include use in buying or selling goods, wares, or merchandise, or in barter or exchange; in determining charges for the carriage or transportation of freight, baggage, or express shipments; in determining wages, compensation, or charges according to the amount of goods or things made or produced, or amount of work or labor done or services performed; in compounding medicinal and other formulae individually submitted for this purpose; in determining weight or measure when a charge is made for the determination; and in all other similar cases."

In our opinion this language effectively eliminates all weights and measures which are for industrial, as distinguished from commercial, use. In other words, we think that the bill certainly excludes by its terms all the articles detailed in the list included in the memorandum except electric meters, gas meters, water meters, and taximeters, since these are the only ones which are used in buying or selling commodities or service.

In view of the above language quoted from the bill the statement that "there is nothing in the bill which excludes mechanics'

# Shop Problems

This Department Will Answer Questions Relating to Shop Practice.

## ASSOCIATE EDITORS

{ JESSE L. JONES, Metallurgical  
WILLIAM J. PETTIS, Rolling Mill

W. J. KEARDON, Foundry  
P. W. BLAIR, Mechanical

CHARLES H. PROCTOR, Plating Chemical

## Brown or Green on Cast Iron

Q.—We would appreciate any information you might give us that would assist our plater to secure either a brown or green color on cast iron. We are now using black, obtained by use of a black nickel solution, but when this is polished off the brass plate shows through. We would like to secure a good rich brown or green shade instead of black. It is to be used on gas heaters and would necessarily have to stand a temperature of about 400 degrees heat.

A.—These are methods used by firms in your line to produce brown or green tones on brass plated cast iron. The first is for brown.

(1) After brass plating the cast iron uniformly and scratch brushing, immerse for a few moments in the following coloring dips, seeing, of course, that articles are clean and free from oxidation:

### SOLUTION No. 1

Water ..... 1 gal. at 180° F.  
Copper sulphate ..... 2 to 4 ozs.  
Sodium chlorate ..... 2 to 4 ozs.

This solution should be thoroughly mixed. After a moment or two of immersion, the brass plated articles will assume a dark olive green tone. They should then be removed and immersed in solution No. 2, given below, until the color is a deep brown, after which they should be washed thoroughly in cold and boiling waters alternately, and scratch brushed with a soft brass wire brush to even up the finish; then a final coat of lacquer should be applied, as usual.

### SOLUTION No. 2

Aqua ammonia, 26° ..... 1 gallon  
Red antimony sulphide ..... 8 ozs.

Heat the ammonia in a stoneware vessel; place it in a hot water tank so that a temperature of 160 to 180° F. may be maintained. Dissolve the red antimony sulphide thoroughly in the heated ammonia. If necessary, the amount of antimony oxide may be increased; the solution should be semi-plastic.

(2) The second method to produce a green deposit is by electroplating in the following solution:

Water ..... 1 gallon  
Potassium bichromate ..... 12 ozs.  
Copper sulphate ..... 4 ozs.

The materials should be dissolved in about one-half of the water first, at boiling temperature; then add the balance of the water cold. Operate the solution at normal temperature with copper or brass anodes at 4 to 5 volts. Plate the articles for a few minutes. They will then have a yellow deposit on them. Remove; allow to hang in the air for a few moments; then wash thoroughly in cold and boiling waters. Brush off the yellow coating and the dark green deposit will be found beneath, which should be a satisfactory result for your purposes. Lacquer the articles as usual.—C. H. P. Problem 3,740.

## Brush Brass Finish

Q.—We are interested in finding a good, economical process of putting a "brush brass finish" on articles stamped out of .040 gauge sheet brass. The articles are switch plates.

A.—You do not mention the shape or size of the articles made of .040 gauge sheet brass which you desire to give a brush brass finish, but the usual procedure is as follows:

The articles should first be either bright acid dipped or cut down to a smooth surface with ordinary cutting-down buffs, using either tripoli compound or emery paste compound as the cutting or polishing factor. If a tampico bristle wheel is used instead of a cloth buff wheel and emery paste compound as the brushing factor, resulting finish can be considered as a brush finish. All

that is necessary then is to dry clean the articles in benzene or naphtha. Dry out carefully in maple wood sawdust and, finally, lacquer by dipping or spraying. If the first method is used, viz., acid bright dipping or cutting down with tripoli as outlined above, then the grease should be removed with benzene or naphtha, as directed, or cleansed in hot alkaline cleaner and then washed thoroughly in cold water. The articles should then be finally brushed down with a soft brass wire scratch brush run at a speed of 500 revolutions per minute. The abrasive should be fine powdered pumice stone mixed with water and a little cheap wheat flour to keep the pumice stone plastic while wet. A very bright brushing is all that is required. Finally, dry out the articles and lacquer as outlined above.—C. H. P. Problem 3,741.

## Is Chromium Plating Practical?

Q.—I do a large amount of work on automobile nickeling, also, as well as polishing and lacquering of such parts. I have been reading about chromium plating in THE METAL INDUSTRY and elsewhere. Do you think it is going to be a practical plate to operate? Will the public be willing to pay the extra cost of it?

A.—Practical job platers are chromium plating automobile parts and other articles successfully, but naturally they must meet the conditions that deposition of chromium requires for successful commercial results. It is well for you to study the subject thoroughly before proceeding. With all the factors considered, the returns for chromium plating should be 50% more than for nickel; and it is worth this larger cost.—C. H. P. Problem 3,742.

## Old English Finish on Brass

Q.—Can you tell us how to obtain an Old English finish on a line of brass lanterns to make them look like antique? We have tried various methods but cannot get it.

We would also like to know what will take the shine off articles made of tin.

A.—We suggest that you try the following processes for the Spanish or Old English burnt brass finish. Articles of brass to be finished this way should either be bright acid dipped or polished down to a semi-lustre finish, using either a bristle brush wheel or regular cutting-down buffs for polishing, with either emery paste or a cutting compound made of tallow and pumice stone as the abrasive. After polishing the articles should be cleansed as for ordinary plating. Solutions follow:

### DIPPING SOLUTION, No. 1

Water ..... 1 gallon at 200° F. temperature.  
Copper sulphate ..... 2 ozs.  
Sodium phosphate ..... 2 ozs.  
Dissolve together.

### SOLUTION No. 2

Aqua Ammonia, 26° ..... 1 gallon  
Red sulphate of antimony ..... 4 ozs.

Mix the materials in an acid crock and surround the crock with boiling hot water so that a temperature of 180° to 200° F. can be maintained. It is possible that the red sulphide of antimony can be increased to 8 ozs. per gallon of ammonia. This you may be able to determine according to the finish you desire. Immerse the brass articles first in No. 1 solution for a minute or two; then remove and wash in water. Keep this rinse water as a toning solution, only adding water as required. Finally wash in boiling water and dry out with maple sawdust. The dark brown oxidation may then be rubbed through with steel wool or with slow-running buffs and a little tallow and pumice composition. Finally, lacquer or wax with any good floor wax; a very small amount of

wax applied to a canton flannel buff rotating at a speed of 500 revolutions per minute will prove very effective. You might also try the following solution; it may give you the finish you desire in one operation:

Water .....	1 gallon
Caustic potash .....	8 ozs.
Red oxide of antimony.....	2 ozs.
Polysulphide .....	¼ oz.
Ammonia, 26° .....	½ oz.

Temperature, 200° F.

Immerse for a few moments, then rinse in boiling hot water only. Finish as previously outlined.

For producing a dull finish on tin plate articles, make up a solution as follows:

Water .....	1 gallon
Sulphuric acid .....	10 ozs.
Nitric acid .....	1 oz.

Heat to 200° F.

Either immerse the tin articles in the solution for a moment or apply with a sponge. The tin articles should be free from grease before the mixture is applied. Rinse in cold and in boiling waters. Dry out and wax or lacquer. Kindly advise us as to results obtained with this data.—C. H. P. Problem 3,743.

### Old Spanish Brass Finish

Q.—Can you tell the one or two formulas most in use for producing the so-called Oxidized Bronze finish demanded by furniture manufacturers on drawer pulls and the like? To secure the same fine results on steel or iron parts does one put on a brass plate and follow this with a regular bronze treatment?

A.—We presume you refer to the Old Spanish brass finish, also termed the Old English burnt brass finish. These finishes predominate at present for furniture hardware and antique brass articles.

If the basic metal is other than ordinary yellow brass, it must be brass plated with a good yellow brass deposit. Coloring solutions for the desired finishes are as follows, to be used after the articles are clean and bright:

#### SOLUTION 1

Water .....	1 gallon
Copper sulphate .....	2 ozs.
Sodium chlorate .....	2 ozs.

Immerse the articles for a moment or two. A greenish bronze tone will result. Remove and wash thoroughly in cold water. Then immerse in following:

#### SOLUTION 2

Aqua ammonia, 20° .....	1 gallon
Red antimony oxide .....	4 ozs.

The second solution should be heated to 200° F. When the articles treated in the first solution are immersed in the second they will assume a dark, chocolate brown. They should be removed and rinsed in hot water, then in cold, then in boiling hot water. First hot water rinse should be used to give an added tone to the articles, so it must not be so arranged that the water will run continuously, but only as required to maintain its original volume. Finally, dry out in a centrifugal dryer or with sawdust. Relieve the articles as desired, with slow running buffs and a tallow and finely powdered pumice stone buffing composition. The red antimony mentioned in Solution 2 may be increased if the solution does not work rapidly enough. The product should finally be lacquered.—C. H. P. Problem 3,744.

### Polishing Die Cast Aluminum

Q.—I am interested in polishing die cast aluminum such as the two small samples I am sending you. I want to get a high buffed finish. I rough with No. 90 Turkish emery, fine on 140 T. E. and refine on 200 Turkish emery grease with felt wheel, 240 Turkish emery. Then I buff and clean by a quick dip in caustic soda, followed with cold water, then acid dip and cold water, followed by hot water and color buff.

Most of the castings come out fine, with a bright, mirror lustre, but some have a drag-out spotted appearance. I have been informed that the drag-out effect can be overcome, but I find that the more they are pursued the worst they get; or at least they get no better. I am at a loss as to whether the small dark spots are silicon or carbon taken up by the alloy from the iron melting pot. The drags show up with the first buff. Please give me what information you can on this.

A.—Try the following operations: Rough out with No. 90 Turkish emery. Fine on 140 emery. Refine on 200 emery. Cut down with tripoli; apply a little kerosene to the buff wheel as a lubricant. Color buff a good composition, using a little kerosene. Wipe clean on a canton flannel wheel. A little English air floated whiting mixed to a paste with kerosene and denatured alcohol in equal parts may be used as the final coloring medium. Use but very little on the canton flannel wheel. It should not be necessary to use either the caustic soda or acid dips. The greater part of your problem is due to a dirty aluminum metal. A close examination of the samples of polished aluminum under a 10-power magnifying glass shows a finely blistered metal. The dark spots denote carbon fused into the metal. The carbon presumably comes from the iron pot, unless the metal is covered with charcoal to prevent oxidation losses. Zinc chloride should be used as a clarifying agent to produce clean metal, just as sal ammoniac is used on top of molten zinc. Naturally, the more you polish the dirty metal the worse it appears. You are using too many polishing operations at present.—C. H. P. Problem 3,745.

### Rust-Proofing Steel Reeds

Q.—I am engaged in the manufacture of duck calls and have been using different kinds of material for the metal reeds. These reeds produce an imitation of the duck language when caused to vibrate by the breath. I find thin tempered steel fairly well suited for my purpose, and am enclosing one of the reeds I use. The trouble I am having with these reeds is that they soon rust. I have had them plated with copper, but this is not a sufficient protection. I understand this metal can be so treated as to prevent any rust forming and I shall be greatly obliged if you will give me name and address of any firm that can do this work for me. The ideal metal for my use is copper, but the copper I have been able to get is too soft. I use a reed of copper ¾ in. wide at one end and ½ in. at the other; length 2¾ in. This is about .012 in. thick at large end, and about half way down the length of the reed it is draw filed from .012 down in an even taper to .006 in.

I should like to ask if there is any firm that can grind these strips for me. I have a die to cut them, but have never been able to get them ground. I have had them draw filed by hand, which is unsatisfactory in every way, as well as expensive.

A.—The sample of steel reed you sent us will be cadmium plated and returned to you for testing by constant dipping in water and allowing the water to evaporate on the cadmium plated surface. This test will prove to you the advantage of cadmium plating as the best rust preventive you could possibly apply to the steel reed. Copper plated steel is not rust-proof. When the sample is returned to you, we shall be pleased to furnish you with the plating data. There are firms in your district (Bronxville, Tenn.) who manufacture stoves and ranges and consequently do polishing and plating. They could readily do your plating and with the data we could furnish the local job plater who has done some work for you in the past could do it. The polishing can readily be done in sheet form by the use of Tampico bristle wheels and flour emery polishing composition. The thin steel would have to be secured to a steel plate or hard wood frame to hold it during the polishing operation. The local job plater should be able to polish the steel. Afterwards, you could do your presswork. It would be difficult to secure copper sheet as thin as your sample that would have the hardness and flexibility of steel. Phosphor bronze sheet would answer your purpose, we believe. You might send a sample of the steel to the American Brass Company, Waterbury, Conn., and see if they could match the hardness of the steel reed in phosphor bronze.—C. H. P. Problem 3,746.

# Patents

## A REVIEW OF CURRENT PATENTS OF INTEREST

1,653,482. December 20, 1927. **Flux Applied in Soldering Aluminum and its Alloys.** Oscar Spengler, Dessau, Anhalt, Germany, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt, Germany. A flux for soldering aluminum and its alloys, including approximately 25 per cent of a halogenide of a metal capable of dissolving the oxides of the metal to be soldered and the soldering metal and about 75 per cent of a mixture of three halogenides of alkali-forming metals including in substantial proportions lithium chloride and calcium chloride.

1,654,527. January 3, 1928. **Process of Producing Metallic Antimony and Alloys of Antimony and Alkali Metal Arsenates.** Harvey M. Burkey, Plainfield, N. J., assignor to American Metal Company, Ltd., New York. The process which comprises combining the trioxides of antimony and arsenic in the presence of a fused alkali metal compound and separating the metallic antimony from the fusion.

1,654,528. January 3, 1928. **Process of Producing Metallic Antimony and Alloys of Antimony and Alkali Metal Arsenates.** Harvey M. Burkey, Plainfield, N. J., assignor to American Metal Company, Ltd., New York. The process which comprises combining the trioxides of antimony and arsenic in the presence of a fused alkali metal compound and a metal adapted to alloy with the antimony.

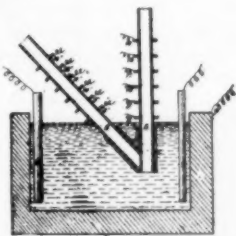
1,653,630. December 27, 1927. **Alloy.** Edward Kiam, New York, N. Y., assignor of one-half to Matthew G. Collins, New York. An alloy consisting of nickel in the proportion of from thirty per cent to sixty-five per cent; of tungsten in the proportion of from fifteen per cent to forty per cent; of chromium in the proportion of from fifteen per cent to thirty per cent; of manganese in the proportion of from one per cent to eight per cent; and of magnesium in the proportion of from five per cent to one-half of one per cent.

1,653,805. December 27, 1927. **Method of Removing Enamel from Electrical Conductors.** William G. Houskeeper, South Orange, N. J., assignor to Western Electric Company, Incorporated, New York, N. Y. The method of treating an electrical conductor insulated with a layer of enamel-like material comprising a solid hydrocarbon and a non-drying vegetable oil subjected to destructive distillation and a wrapping of fibrous material, which comprises treating the conductor with monochlorobenzol for a period of time sufficient to soften the enamel, immediately thereafter impregnating the fibrous insulation with wax, and stripping the fibrous insulation and enamel from the conductor.

1,654,157. December 27, 1927. **Die-Casting Machine.** William F. Bailey, Canton, Ohio, assignor to The Hoover Company, a Corporation of Ohio. In a die casting machine, a frame on which a ram, die and goose neck are carried, a support to which one end of the frame is pivotally mounted and a support for the other end of the frame.

1,654,716. January 3, 1928. **Rust-Proofing Process.** William H. Allen, Detroit, Mich. The process which consists in treating iron or steel articles with a rust proofing solution adapted to form an iron compound upon the surface of said articles and at the same time subjecting said articles to a treatment to prevent crystal growth upon the said surfaces.

1,654,910. January 3, 1928. **Process for Treating Articles in Metallic Baths.** Noël Jean Barbier, St. Etienne-Loire, France. The method of applying metal to an article comprising immersing the article in a bath of the molten metal, and heating that portion of the molten metal immediately surrounding the immersed article to a temperature not less than that of the remainder of the molten metal by passing an electric current through the immersed article, used as one electrode, and the molten metal, used as the other electrode.



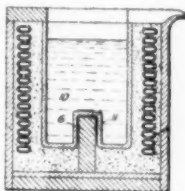
1,655,269. January 3, 1928. **Treatment of Metals.** Goodwin H. Howe, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. The process of protecting metallic articles from oxidation which consists in covering the articles at ordinary temperatures with a coating composed of aluminum powder and a liquid nitrocellulose binder which wets and firmly adheres to metals at ordinary temperatures and volatilizes at higher temperatures, drying the coating and then firing at a temperature at which the aluminum alloys with the metal of the article, said temperature being above that at which the binder volatilizes.

1,655,273. January 3, 1928. **Joining Metals.** Floyd C. Kelley, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. The process of uniting a body of ferrous metal with a body of copper which consists in first providing said ferrous metal with a film of molten copper in the presence of a reducing agent, and then uniting the copper body with said coated surface by brazing.

1,655,781. January 10, 1928. **Apparatus for Electroplating.** Giovanni Caraccio, Genoa, Italy. Improvements in an apparatus for electroplating characterized by a receptacle with a cover which is supplied with fastening means for the cathode, these fastening means consisting of screws of conductive material, which penetrate circular holes of the cathode and carry clamps, which can be adjusted axially as well as radially with respect to the axis of the screw, so as to be pressed against the wall of the hole of the cathode, whereby the cathode is connected with the screw.

1,655,960. January 10, 1928. **Automatic Soldering Device.** Willem Koning, Eindhoven, Netherlands, assignor to General Electric Company, a Corporation of New York. In a soldering device, the combination of solder feed mechanism for reciprocating the end of a rod of solder into and out of soldering position, movable solder heating means for the solder, and actuating means for controlling said mechanism and said heating means to heat the end of the rod of solder during its forward movement and the joint during the first portion of its backward movement.

1,655,983. January 10, 1928. **Induction Furnace.** Porter H. Brace, Wilkesburg, Pa., assignor to Westinghouse Electric & Manufacturing Company, a Corporation of Pennsylvania. In an induction furnace, an induction coil, a crucible containing a metallic charge within said coil, and a partial core of magnetic material projecting partially into said crucible so that one end thereof is surrounded by said metallic charge.



1,658,222. February 7, 1928. **Electrocleaning.** Robert M. Burns, Brooklyn, N. Y., and Clarence W. Warner, Glen Ridge, N. J., assignors, by mesne assignments, to Western Electric Company, Incorporated.

The method of treating metallic surfaces which comprises immersing said surfaces in an electrolyte comprising phosphoric acid, controlling the temperature of said electrolyte so that it is as high as 50° C., controlling the concentration of said electrolyte so that it is as high as 70%, and passing an electric current from said surfaces as anodes to suitable cathodes immersed in said electrolyte.

1,658,650. February 7, 1928. **Oscillating Centrifugal Machine.** Henry W. Pleister, Westfield, N. J., assignor, by mesne assignments, to Henry B. Newhall Corporation, Garwood, N. J.

A method of removing excess molten metal from articles, said method comprising moving the articles in a curved path, and subjecting the article to oscillation while being thus moved.

1,658,702. February 7, 1928. **Metal Composition.** Karl Bernhoeft, Oberschoneweide, Germany assignor to General Electric Company, a Corporation of New York.

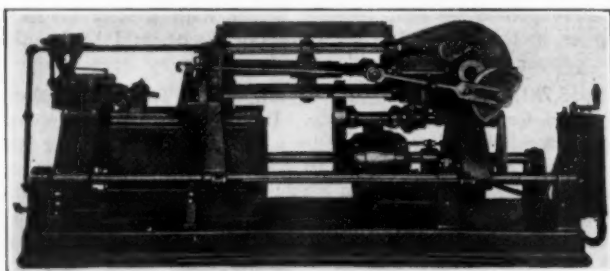
A metal composition consisting of 98.4% aluminum and containing 1.6% cadmium.

# Equipment

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST

## Madison-Kipp Die-Casting Machine

The Madison-Kipp Corporation, Madison, Wis., is primarily a manufacturer of automatic pressure lubricators, using in its ordinary production large quantities of die-castings. When the advantages of manufacturing such parts in its own plant became apparent, the company's engineers set about designing a die-casting machine to suit its needs, and in 1920 the first machine was set in operation. After development and refinement it was rapidly turned into a highly efficient unit, from the viewpoints of both the rate of production and the quality of its products. Then the company found that similar equipment was in demand by other users of die-castings and it was decided to enter into the commer-



MADISON-KIPP DIE-CASTING MACHINE

cial production of die-casting equipment to cover a wide range of output; by 1923 this was accomplished and the Madison-Kipp Corporation also developed a complete die-casting service which provides automatic dies for users of the machine. The company makes the following claims for the machine, an illustration of which is given herewith:

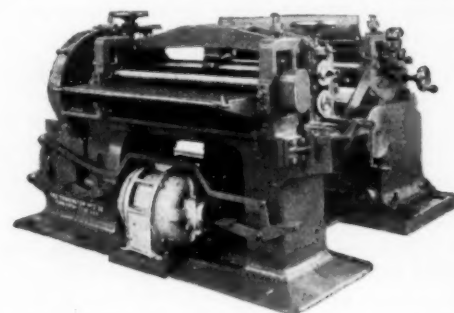
The Madison-Kipp is a one-man machine—even on the most complicated dies only one operator can be used. All movements of machine and die are controlled by one clutch lever which operates a Carlyle-Johnson clutch. The machine may be operated continuously. The machine is equipped with individual motor drive. The motor is a 2-h.p., multi-speed, Fairbanks-Morse with which the machine may be run at various speeds for 4, 6, 8 and 12 "shots" per minute. The machine can be stopped with the die in any position and reversed from any position. It is a universal machine and will produce castings of great range in size. It will handle zinc or aluminum base metals. Almost any number of cores may be pulled in any direction.

The movement of the dies, the movement of the cores, the movement of the metal and the movement of ejector mechanism are fully automatic and take place in proper sequence with safety features to protect operator and mechanism. Parts and dies requiring occasional change are easily removed and replaced. The main operating portion of the machine is slidably mounted on a one-piece base to provide quick setting for different die sizes and for changing metal pots. Lubrication of all important friction parts is automatic from a Madison-Kipp Fresh Oil System. The worm and worm wheel and ball thrust bearing are enclosed and operate in a bath of oil. Metal is moved into the die by air, the pressure of which may be quickly adjusted to suit the particular conditions of the part to be cast and its die. The simplicity of this die-casting machine design makes a heretofore somewhat mysterious science comparable to almost any profitable production process in mechanical industry controlled by the usual type of production foreman and operators.

Standard zinc and aluminum base alloys of time-proved qualities as to strength, purity, corrosion resistance and finish are available in the open market and carried in large stocks by reliable metal companies for immediate shipment. The furnace is made of cast iron with fire brick lining, and the metal pot is made of special cast iron alloy, and its capacity is 200 pounds of aluminum base metal and 500 pounds of zinc base metal. The standard furnace is equipped with a gas burner unit.

## Improved Slitting Machine

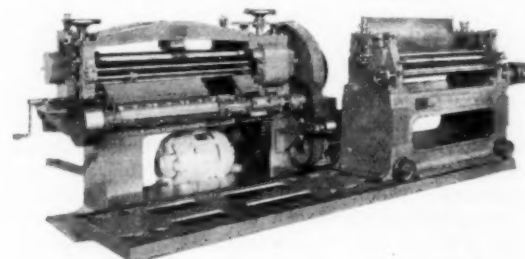
The Torrington Manufacturing Company, Torrington, Conn., has announced a recently designed combination of a slitting machine with lawn-mower type scrap cutter and 3-roll coiler, in which it



SHOWING ENTERING SIDE OF SLITTER, GUIDE TABLE AND CONTROLS

is possible to take 5 cuts of copper  $\frac{1}{8}$  in. thick up to 42 in. trimmed width, with facility for cutting up the scrap edges and coiling the slit strips, all in one operation.

The equipment consists of a slitter of wide face, with a reinforcing bridge preventing springing of cutter arbors; a pair of driven feed rolls for entering metal in the slitter; a scrap cutter



EXIT SIDE OF SLITTER, SHOWING SCRAP CUTTER, WITH GUARD REMOVED, GUIDES AND TEX ROPE DRIVE, COILER IN NON-WORKING POSITION

built integral with slitter, equipped with guides and operated by a Tex Rope drive; and a separate 3-roll coiling unit, slidably mounted on rails, and equipped with feed rolls which act as burring rolls for the slitter.

The combination unit is driven by a single motor with power transmitted through a friction clutch, controlled by a double foot treadle.

## New Compound for Skin Diseases

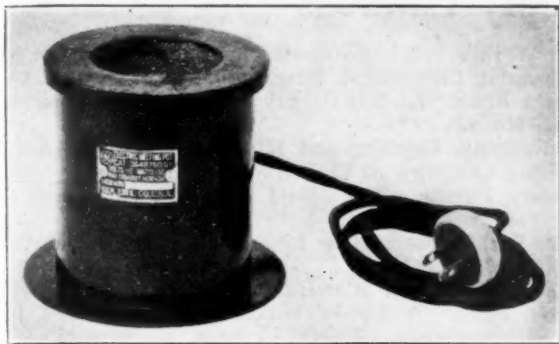
The Teggo Manufacturing Company, 1755 North Troy Street, Chicago, Ill., is manufacturing a new compound known as "Teggo" which, it is claimed, prevents skin diseases and also permits easy washing of hands after they become grimy from factory work. Discolorations are said to be obviated by applying the compound, which is a creamy, white substance, before starting work. It penetrates the pores of the skin, where its antiseptic, germicidal properties prevent skin diseases from originating in case of minor abrasions.

## Tourniquet Stops Bleeding

The Ideal Tourniquet Company, Baltimore, Md., has placed on the market the Ideal Tourniquet, designed as a mechanical means of stopping the flow of blood from cuts and wounds in fingers, arms, legs, etc. It is stated that its ease of operation and handiness make it an invaluable part of the plant or office first-aid chest.

### Portable Tinning Pot

The General Electric Company announces a portable tinning pot as the latest addition to its line of electric heating equipment. This is described as being a convenient device for small tinning and soldering operations and is said to be of good mechanical design, efficiently heat insulated. It is built on the same principle as the larger General Electric melting pots. The heating unit, which is of the cartridge type, dissipates 150 watts. It is placed in a boss cast on the bottom of the crucible and is readily re-



PORTABLE ELECTRIC MELTING POT

movable. The crucible and base are made of cast iron and the jacket is made of sheet steel. The connecting lead is a heavy, Deltabeston heater cord and the plug is of the armed type.

This pot is particularly designed for solder and tin, having a maximum operating temperature of 500 deg. F. About 15 minutes only are required to reduce the full contents of the pot to working temperature.

The pot is normally designed for operation on 110-volt circuits, but can be supplied for operation on 100-, 120-, 240-volt circuits if desired. Approximate shipping weight is 6 lbs.; dimensions: 2½ in. diameter and one inch deep, inside, and 5 in. diameter and 4½ in. deep, outside.

### Oven Insulation Tested

Nonpareil insulating brick, manufactured by the Armstrong Cork and Insulation Company, Pittsburgh, Pa., were found to have the following advantages when used in core ovens at the plant of the Ferro Machine and Foundry Company, Cleveland, O., according to a survey made by engineers of the A. C. Nielsen Company, Chicago, in collaboration with F. A. Coleman, director of research of the Ferro Machine and Foundry Company: Used under 24-hour per day operation in core ovens for 300 days a year, Nonpareil bricks were found to give good results; principal features are lightness and strength; cost study showed savings of 15% in fuel for coke-fired ovens and 20% in power for electrically heated units; net savings were \$2,221 per year on 28 coke-fired ovens, equivalent to 33% net return on added cost of Nonpareil insulating materials, and \$4,115 per year on 5 electric ovens, equivalent to 76.2% net return on cost of insulation. The above figures and statements, as well as those following, have been excerpted from a published report certified by the Nielsen company. Brief description of the use of Nonpareil insulation in coke-fired and electric core ovens at the Ferro Machine plant follows:

The Nonpareil-insulated core baking equipment includes 28 coke-fired units, 5 electrically heated double-end roller-drawer units, and 1 continuous-type oven containing a double line of 24-inch conveyors, 24 feet long. All oven equipment is the product of the F. A. Coleman Company. Coke-fired ovens are arranged in four batteries of seven units each. The coke used has a heating value of about 13,500 B.t.u. per pound and produces a fire box temperature of about 2,500 deg. F. Recording thermometers applied to each of the ovens guide in the regulation of oven temperature and indicate an average of about -500 deg. F. subject to a maximum variation of 100 deg. F. due to the opening and closing of the doors as cores are put in or removed on racks by means of electric lift trucks.

The coke-fired ovens measure 5 ft. x 14 ft. x 6½ ft. inside. Walls are insulated with 9 inches of Nonpareil brick, sliding lift doors with 4½ inches of Nonpareil brick, and roofs with 6 inches

of Nonpareil Insulating Filler. The fire boxes, of which one is provided for each battery of seven ovens, have 4½ inches of Nonpareil insulation. Roller-drawer ovens, five in number, are also insulated with Nonpareil brick. These are designed for electric heating and, like the coke-fired ovens, are in regular service on a 24-hour basis for 300 days a year. Each of the double-end drawer-type ovens has three drawers 3 feet wide and 6½ feet deep. Walls and roofs are insulated with 9 inches of Nonpareil, drawer fronts with 4½ inches, and oven bottoms with 7½ inches. "Brown" recording thermometers are used and thermostatic controls hold a temperature of 600 deg. F. The average power input to each oven is about 40 kw.

Lightness, good heat insulating quality, and mechanical strength are claimed as the major advantages of Nonpareil brick under the conditions at this plant.

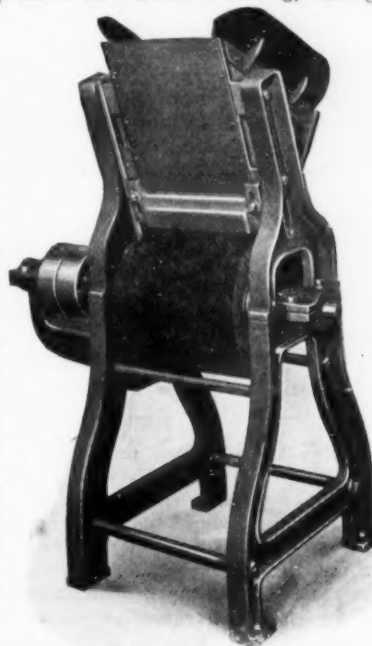
A battery of seven ovens requires a total of 28,000 brick and the cost, with Nonpareil, is \$1,680.00 more than with common brick. Depreciation and average interest on this amount are calculated on the basis of a 25-year life and total \$119.62. The net annual saving is taken as the difference between the gross saving and the added annual cost.

A similar study is shown for the electrically heated oven. No other brick were considered in this case and the net return on the investment is determined as the difference between the gross power saving and the total annual fixed charge on the investment in Nonpareil brick.

### Sand Mixer, Cutter and Separator

The Monarch universal sand mixer, manufactured by the Monarch Engineering and Manufacturing Company, Baltimore, Md., includes at one time the apparatus for three operations which are necessary for sand preparation in foundries: mixing, cutting and separating. This, it is

claimed, makes for a great labor saving and also for highly efficient sand preparation, besides aiding in the production of finer moulds. It is claimed that sand run through this machine is equivalent to sand that has passed through a No. 16 sieve. The machine operates simply, and is ruggedly constructed, the only replacement necessary being the cylindrical wire brush below the hopper feed. The brush operates at 900 r.p.m., throwing the clean mixed sand in a heap close to the machine and the heavier particles, such as nails, bits of metal, etc., in another heap farther away from the machine. Up to 25



UNIVERSAL SAND MIXER

tons of sand can be mixed and separated from foreign matter in 12 hours, depending only upon the speed with which the sand is shoveled into the machine, it is stated. The company also builds a double hopper type on the same order, for use by foundries requiring larger capacity equipment in a limited space. A double cylindrical brush type of machine is made for heavy sands and loam moulding. Wheels for making the machines portable can be supplied, as can motors to supplant the belt drive for which pulleys are supplied on the standard types.

### Pangborn Equipment Exhibit

The Pangborn Corporation, Hagerstown, Md., manufacturers of sand blast and dust suppression equipment, will have the largest space ever used by a single exhibitor at the annual equipment ex-

hibit of the American Foundrymen's Association, to be held in conjunction with the convention at Philadelphia, Pa., during the week of May 13, 1928. The company states that instead of a large variety of machinery its exhibit this year will be devoted to a vivid exposition of radical departures in new devices for sand blast cleaning. It will tend to display that hitherto accepted methods of cleaning many foundry products are to be entirely revised by the introduction of automatic, continuous, hygienic equipment for performing a very great variety of jobs. New features are to be

displayed in such equipment as sand blast rooms, barrel and table devices, dust arresters and protective clothing. Abrasives and other supplies will be shown and opportunity given for discussion of their suitability for individual needs of users. The company will be represented at the exhibit by Thomas W. Pangborn, president, John C. Pangborn, vice-president, H. D. Gates, sales manager, and a large group of district sales engineers, plant officials and other Pangborn experts who will be on hand to demonstrate and explain the equipment.

## Equipment and Supply Catalogs

**Business Organization.** Policyholders Service Bureau, Metropolitan Life Insurance Company, New York. Number 10 of a series; this one is on Sales Research.

**Centripact Ideal Impact—Attrition Pulverizers.** Centripact Pulverizer Corporation, Denver, Colorado.

**Hardinge Conical Ball Mill.** Hardinge Company, York, Pa.

**Hardinge Unit Coal Pulverizer.** Hardinge Company, York, Pa.

**A Few Pulverizing Problems.** Hardinge Company, York, Pa.

**Electric Apparatus Used with Cottrell Precipitation Process.** General Electric Company, Schenectady, N. Y. **Other General Electric publications:** Fan-cooled Induction Motors; Automatic Starters for Slip-ring Motors; Synchronous Motors for Mounting on Compressor Shafts; Limit Switch for Control Circuits.

**Ajax Electric Furnaces.** Ajax Electrothermic Corporation, Trenton, N. J. Bulletin No. 5 on larger melting furnaces; contains list of users of Ajax motor-generator operated equipments.

**Recent Developments in Steam Generation.** By George T. Ladd, president. Ladd Water Tube Boiler Company. An address delivered before the Engineers' Society of Western Pennsylvania, January 17, 1928. Distributed by the Combustion Engineering Corporation, New York.

**Levelling and Stretching Machines.** The Torrington Company, Torrington, Conn.

**The Story of Combustion.** By Donald Wilhelm. Reprint

from World's Work, distributed by International Combustion Engineering Corporation, New York.

**Some Brick.** Laclede-Christy Clay Products Company, St. Louis, Mo.

**Pulverizing, Grinding and Mixing Machinery.** Abbe Engineering Company, 30 Church Street, New York.

**Rotary Pumps.** Beach-Russ Company, 30 Church Street, New York.

**Linc-Weld Motors.** The Lincoln Electric Company, Cleveland, Ohio.

**Electric Fans and Blowers.** American Blower Company, Detroit, Mich. A dealers' pocket price book dated June 1, 1927, and superseding a previous issue.

**Thermostats for Industrial Appliances.** Robertshaw Thermostat Company, Youngwood, Pa.

**What Is Happening to Business?** The Sherman Corporation, 31 Milk Street, Boston, Mass. Report of a survey of manufacturing industries.

**Electric Controlling Apparatus.** Allen-Bradley Company, Milwaukee, Wis. New bulletins and price sheets for the Allen-Bradley catalog.

**Superiority of Acetylene as a Fuel for Cutting.** The Acetylene Journal Publishing Company, Chicago, Ill.

**How to Make Manganese Bronze.** By Samuel Frankel, chief metallurgist, Niagara Falls Smelting and Refining Corporation. Buffalo, N. Y.; this firm distributes the booklet.

**Centripact Pulverizers—Centripact Pulverizer Corporation,** Philadelphia, Pa.

## Associations and Societies

### REPORTS OF THE CURRENT PROCEEDINGS OF THE VARIOUS ORGANIZATIONS

#### Institute of Metals Division

HEADQUARTERS, 29 WEST 39TH STREET, NEW YORK

##### NEW OFFICERS

In the March issue we published a partial list of the new officers of the Institute. Several additions have been made, including the appointment to the executive committee of G. E. Johnson, manager of the International Lead Refining Company, East Chicago, Ind. A complete list of officers and committee men follows:

**Officers:** S. Skowronski, chairman; Zay Jeffries, vice-chairman; W. M. Corse, secretary.

**Executive Committee:** Sam Tour, papers; E. C. Bain, journal; R. S. Archer, non-ferrous data sheets; H. C. Jennison, membership; J. R. Freeman, local section; P. D. Merica; F. L. Wolf; G. E. Johnson; L. W. Spring.

**Papers Committee:** Sam Tour, chairman; R. L. Suhl, nickel; H. A. Bedworth, brass; F. W. Harris, copper; E. R. Darby,

bronze; E. H. Dix, aluminum; H. M. St. John, foundry metallurgy; R. S. Dean, theoretical metallurgy; C. S. Witherell, copper.

**Local Section Committee:** J. R. Freeman, Jr., chairman; R. J. Anderson; G. H. Clamer; R. L. Dowdell; W. A. Scheuch; R. S. Williams; R. F. Wood.

**Research Committee:** Paul D. Merica, chairman; R. S. Archer; W. H. Bassett; W. Campbell; W. M. Corse; H. W. Gillett; S. L. Hoyt; M. A. Hunter; C. H. Mathewson; V. Skillman; A. E. White; H. M. Williams.

**Journal Committee:** E. C. Bain, chairman; W. A. Cowan; E. H. Dix, Jr.; W. H. Finkeldey; S. L. Hoyt; James T. Kemp; A. B. Kinzel; H. S. Rawdon; H. M. St. John; E. E. Thum; S. Tour.

**Data Sheet Committee:** R. S. Archer, chairman; T. S. Fuller; C. H. Mathewson; F. L. Wolf; J. Strauss.

**Annual Lecturer Committee:** Zay Jeffries, chairman; G. K. Burgess; W. Campbell; W. M. Corse; G. H. Clamer.

## American Electroplaters' Society

HEADQUARTERS, CARE OF W. S. BARROWS, 628 DOVERCOURT ROAD, TORONTO, CANADA

### CONVENTION COMMITTEE REPORT

The office of the Toronto Branch Convention Committee is now "open all night," and reports from the various out-finders indicate that we are going to have a bumper attendance, an unexcelled educational program, and a busy four days in June.

Authors of papers possessing outstanding qualities with respect to any phase of modern plating or metal finishing prac-

tice desiring to appear on the educational program should send us their names and titles of papers at once.

We advise delegates and visitors to "double up" when making reservations at hotels; double rooms will be more easily obtained. In any event, they should make reservations at once. Motorists will find extracts from Toronto's Street Traffic Regulations in the Souvenir Program; in fact, everyone intending to visit Toronto will find much to interest them in

this booklet which will be mailed early in June. The sight-seeing tour of Toronto will be of particular interest to everyone, regardless of nationality or residence. The historic landmarks blend into the picture of modern architecture so perfectly that the whole panorama is pleasing to the eye. The birthplace of Mary Pickford, the "sweetheart" of an entire continent, churches, hospitals, Parliament buildings, beautiful homes, lifelike statuary, Casa Loma (a palace of exceptional beauty), all in settings just a little different than you have at home will make you like it and want to come again.

Plan your convention trip so that you may browse around among the Muskoka Lakes, a few hours' journey north, where you can enjoy the comfort of lakeside inns, the thrills of jaunts over Indian trails, swimming, motoring and fishing, and return to your home feeling refreshed and in better condition to operate that chromium bath than ever before. Canadian air will put you right upon your toes.

W. S. BARROWS, Secretary.

### Bridgeport Branch

HEADQUARTERS, CARE OF WILLIAM EHRENCRONA, 872 HANCOCK AVENUE, BRIDGEPORT, CONN.

#### ANNUAL BANQUET

The Bridgeport Branch of the American Electroplaters' Society will hold its annual educational session and banquet on Saturday, April 28, 1928, at the Stratfield Hotel, Bridgeport, Conn. The educational session will take place at 2:00 p.m., and will follow the closing of the meeting of the American Electrochemical Society, which will be held at the same hotel on April 26, 27 and 28, 1928. The members of that organization have been invited to attend the session and banquet of the Bridgeport Branch and a good number of them are expected to stay over for it.

A good program of papers is being prepared for presentation at the educational session. George B. Hogaboom will be on the program, to speak on the Crystalline Structure of Metals. All the members of the Branch are urged to attend this important session, as well as the Banquet, and the same invitation is extended to members of other Branches wishing to have a good time as well as to hear a good program.

After the banquet in the evening there will be a dance. Complete preparations have been made and those planning to attend are asked to communicate with the secretary, at the address above.

J. C. OBERENDER.

### Chicago Branch

HEADQUARTERS, CARE OF S. C. TRAPP, 1127 NORTH SEVENTH STREET, MAYWOOD, ILL.

#### BANQUET AND EDUCATIONAL SESSION

The Branch held its sixteenth annual Educational Session and Banquet on Saturday, January 21, 1928, at the New Palmer House, Chicago.

The Educational Session attracted a great many members and guests, the large attendance being in part explained by the fact that Past Supreme President O. E. Servis presided, and also by the exceptionally fine program of papers that had been prepared. There were addresses and papers by Charles H. Proctor, Founder of the A. E. S.; Mr. Nixon, Western Clock Company, Peru, Ill.; Fred Greenwald, Past President of Chicago Branch; President Goodsell of Milwaukee Branch and Greene Manufacturing Company, Racine, Wis.; C. Kocour, State Manufacturing Company; Jacob Hay, Past President Chicago Branch, of C. M. Hall Lamp Company, Detroit, Mich.; and "Our Own" Dr. O. P. Watts of University of Wisconsin. All are to be printed. Discussion was tabulated and will appear with each paper as it is published. The committee is to be heartily congratulated upon the manner in which the session was conducted and the high standard of the material presented by the speakers.

The banquet in the evening was highly successful, and the Arrangements Committee, headed by Chairman Gilbertson and Mr. E. Lamoureux, were largely responsible for the fine time that was provided. For their attention to guests and their other activities in relation to the banquet, the general and reception committee are also to be thanked, especially President

R. Meyers and Secretary-Treasurer Trapp, who both toiled many hours on the preparations.

The occasions attracted a great number of the Branch's friends who are members and officers of the Branches in other cities. There were present representatives of the following Branches: Milwaukee, Detroit, New York, Indianapolis, St. Louis, and Grand Rapids. All the past presidents of the Chicago Branch were there, as well as Past Supreme Vice-President Steuernagel and his wife, and members of the Chicago Branch who live in a number of other cities in the Chicago district.

### Hartford Branch

HEADQUARTERS, CARE OF TENNANT ELWIN, 76 CARPENTER AVENUE, MERIDEN, CONN.

#### ANNUAL MEETING AND BANQUET

The annual meeting and banquet of the Hartford Connecticut Valley Branch of the American Electroplaters' Society will be held on Saturday, May 12, 1928, at the Hotel Bond, Hartford.

There will be an afternoon educational session starting at 3:00 o'clock, at which George B. Hogaboom will preside. Papers will be presented as follows:

Silver Plating, by F. K. Mesle.

Anodes and Cathodes, by A. K. Graham.

Varnish Finishes, by Amos Bissell.

Lacquer, by Mr. McPherson.

Chromium Plating, by Oliver Sizelove.

There may also be additions to this program which will prove most interesting to all those who can attend the session.

The banquet in the evening will be followed by an entertainment and dancing.

TENNANT ELWIN, Secretary.

### Newark Branch

HEADQUARTERS, CARE OF R. F. CLARK, P. O. BOX 201, NEWARK, N. J.

#### ANNUAL MEETING AND BANQUET

The annual educational session and banquet of the Newark Branch of the American Electroplaters' Society is to be held at the Elks' Club, 1048 Broad Street, Newark, N. J., on Saturday, April 14, 1928, starting at 3 p. m. sharp. It had previously been planned to hold this function at Achtel-Stetter's, but that place is not available and it will be held at the Elks' Club. A good program of papers has been prepared and there will be fine music and other entertainment at the banquet in the evening. All the members of the Branch, the members of other Branches, and all others interested in the electroplating industry are invited to attend. Tickets can be reserved by communicating with Royal F. Clark at the address given in the heading of this announcement.

### New York Branch

HEADQUARTERS, CARE OF R. J. LIGUORI, 127 VANDERBILT AVENUE, BROOKLYN, N. Y.

Two well-attended meetings of the Branch were held at Room 611, Pulitzer Building, Park Row, New York City, in February. At these meetings the members discussed Burnt Brass and French Bronze finishes.

The Branch also held two meetings in March, one on Friday evening, March 9 and the other on Friday evening, March 23, 1928. The first of these meetings was enlivened by a delegation from the Newark Branch, including Messrs. H. Smith, O. Sizelove, G. Wagner, P. Sievering, G. Onkson and others. The members of the New York Branch were pleased to hear about Newark's progress in chemistry and other activities. Among the other guests at this meeting were Past Supreme President Mesle, who made some interesting remarks, and another member of Mr. Mesle's branch.

On March 23 there was a meeting devoted to business.

Members are urged to attend the meetings regularly, to present their problems before the whole membership, and also to aid in solving the problems of other members.

THOMAS A. GARDNER, Recording Secretary.

## American Electrochemical Society

HEADQUARTERS, COLUMBIA UNIVERSITY, NEW YORK CITY

### MEETING AT BRIDGEPORT

The American Electrochemical Society is holding its annual meeting at Bridgeport, Conn., attracted to this district owing to the epoch-making developments in the electric manufacture of brass. It was only a few years ago that all brass was made in gas or oil heated pots. Then came the invasion of the well-known electrochemists, T. F. Baily, H. W. Gillett, C. Hering and E. F. Northrup, who demonstrated that brass made electrically was far superior in quality to any brass made heretofore.

On April 26, 1928, the society will convene at the new and well-appointed Hotel Stratfield, Bridgeport, Conn., and will devote all of Friday morning to the discussion of electric heating, melting and electric furnace linings. Among those who will participate in this discussion are R. E. Talley, president and chief engineer, George J. Hagan Company, Pittsburgh, Pa.; R. M. Keeney, industrial heating engineer, Connecticut Light and Power Company; John L. Christie, metallurgist, Bridgeport Brass Company; Dr. B. D. Saklatwalla, vice-president, Vanadium Corporation of America, and others.

The Thursday morning session at the Hotel Stratfield will be devoted to a discussion of new batteries, and Dr. George W. Vinal of the United States Bureau of Standards will preside.

Thursday afternoon the members will proceed upon a tour of inspection of the factories in Bridgeport and vicinity, factories which have gained an international reputation for their high quality products and efficient methods of manufacture.

Thursday evening there will be a public lecture by Professor Bergen Davis of Columbia University, whose investigations are familiar to all. Professor Davis will demonstrate the use of the x-ray in the study of metals and compounds. This is a most promising field, and of interest to all in the metal industry. Professor Davis will show by means of slides the results of years of careful investigation.

The Local Committee is headed by Mr. John L. Christie, metallurgist, of the Bridgeport Brass Company. Mr. Christie has been working for many weeks in arranging for plant visits and social functions. Other members of his Committee include the following: F. M. Turner, Charles J. McElroy, W. G. Stratten, Raymond O'Connor, W. O. Mitscherling, Karl Pitschner, Walter M. Bradley, William Delage, George B. Hogaboom and J. C. Bradley. The main social event of the Electrochemists' Convention will be a dinner and dance on Friday evening.

The final session of the meeting will be held Saturday morning, and will be devoted to the presentation of papers on electroplating of nickel, gold, silver, chromium and thallium. Professor E. M. Baker, of the University of Michigan, expert for the G. C. Spring and Bumper Company, will preside over this session.

## International Fellowship Club

HEADQUARTERS, CARE OF W. J. SCHNEIDER, BOX 119, TIMES SQUARE STATION, NEW YORK CITY

The Secretary-Treasurer of the International Fellowship Club is W. J. Schneider, whose post office address is given above. Frank J. Clark, Springfield, Mass., is vice-president of the Club; he was previously given as secretary, which was an error. The International Fellowship Club was organized a few years ago to promote better relations between salesmen and purchasing agents in the electroplating supply industry.

## American Welding Society

HEADQUARTERS, 33 W. 39TH STREET, NEW YORK CITY

### MEETING WITH CIVIL ENGINEERS

There was a joint meeting of the American Welding Society and the American Society of Civil Engineers, New York Section, on Wednesday, March 21, 1928, at the Engineering Societies Building, 33 West 39th street, New York City. The program included two important addresses: Are Welded Buildings and Bridges, by Gilbert D. Fish, consulting structural engineer; and Oxy-Acetylene Processes of Interest to Civil Engineers, by C. A. Daley, maintenance of way engineer, Air Reduction Sales Company.

### ANNUAL MEETING

A tentative program has been arranged for the annual meeting

of the society, to be held April 25, 26 and 27, 1928, at the Engineering Societies Building.

There will be morning and afternoon sessions each day. On April 26, at noon, there will be a luncheon for members, and in the evening of the same day there will be the annual dinner, a stag affair. There will be technical sessions devoted to such subjects as pressure vessels, structural steel welding, welding the Ford car, procedure standardization in welding, qualifications for welders, inspection, supervision, pipe welding, progress of research committees, and other topics.

## National Association of Foremen

HEADQUARTERS, 1249 U. B. BUILDING, DAYTON, OHIO

### ANNUAL CONVENTION

The fifth annual convention of the association will be held on Friday and Saturday, May 25 and 26, 1928, at Canton, Ohio. In general, the meetings will deal with the question of the foreman as an executive in industry. There will be a number of important addresses by nationally known industrial men. The meeting is open to foremen and executives for the industries of the United States and Canada, whether members or not. There will be a registration fee of \$3 per person which will cover the entire program, including the noon luncheon and evening banquet. Further information may be obtained from E. H. Tingley, secretary of the association, who may be addressed at headquarters as given above.

## Waste Material Dealers

HEADQUARTERS, TIMES BUILDING, NEW YORK CITY

### ANNUAL MEETING

The National Association of Waste Material Dealers held its annual meeting on March 21, 1928, at the Hotel Astor, New York. Henry Lissberger of the Federated Metals Corporation, New York, was elected president for the ensuing year. The following were elected directors for two-year terms:

Louis Birkenstein, S. Birkenstein and Sons, Inc., Chicago, Ill.; James Rosenberg, New York; Ivan Reitler, Federated Metals Corporation, New York; R. W. Phillips, E. I. du Pont de Nemours and Company, Wilmington, Del.; John Murphy, Daniel I. Murphy, Inc., Philadelphia, Pa.; J. M. Maher, Pennsylvania Wood and Iron Company, Buffalo; G. H. Bangs, Western Electric Company, New York; Benjamin Friedman, Metals Refining Company, Hammond, Ind.; George B. Doane, Perry Buxton Doane Company, Boston, Mass.; H. H. Cummings, William H. Cummings and Sons, New York; Albert T. Hicks, Daniel M. Hicks, Inc., New York; Herman Muehlstein and Company, New York; Robert Johnson, General Paper Stock Company, St. Louis, Mo.; S. C. Weber, S. C. Weber Iron and Steel Company, Chattanooga, Tenn.; Nat C. Myers, Myers-Lipman Wool Stock Company, New York.

Director to fill unexpired term of A. Glant: Philip Senegram, of Philip-Senegram Company, Los Angeles, Calif.

## American Zinc Institute

HEADQUARTERS, 27 CEDAR STREET, NEW YORK CITY

### ANNUAL MEETING

The tenth annual meeting of the American Zinc Institute, Incorporated, will be held at the Hotel Statler, St. Louis, Mo., on Monday, April 16, 1928, at 11.30 a. m. Three days, Monday, Tuesday and Wednesday, April 16, 17 and 18, will be devoted to the business of the Institute, including the election of eight directors. The presence of all members is requested.

STEPHEN S. TUTHILL, Secretary.

## Electroplaters and Depositors

HEADQUARTERS, CARE OF S. WERNICK, NORTHAMPTON POLYTECHNIC INSTITUTE, ST. JOHN STREET, LONDON, E.C.1, ENGLAND

S. Wernick, formerly assistant honorary secretary of the Electroplaters' and Depositors' Technical Society of Great Britain, has been elected honorary secretary, to take the place of William E. Harris, who formerly held the office and who has had to resign consequent upon taking up an appointment in Canada. All communications should be directed to Mr. Wernick at the address given in the heading.

## Personals

### Jonathan Bartley

On April 1, 1928, Jonathan Bartley retired from active participation in business. Mr. Bartley is the dean of the crucible and graphite industry and his name is familiar to everyone in any way connected with this industry all over the world.

A man's worth can be judged best by the opinions of his associates. The following biography was written by one who worked with Mr. Bartley for many years, and needs no explanation or support.



JONATHAN BARTLEY

It is safe to say that every business man has at one time or another promised himself a retirement and visioned a freedom from all business cares, to settle down and take things easy when old age begins to make long shadows across his pathway. But comparatively few are sufficiently favored to do this. Some are compelled to retire on account of impaired health; others are held back because of business connections that cannot be severed without great sacrifice. So the man who is fortunate enough to be exempt

from all barriers and is able to enjoy life in the fullest is decidedly to be envied.

Jonathan Bartley was born 68 years ago in a little village in New Jersey called Bartley (named for his grandfather and owned largely by the Bartley family). The thing that put this little place on the map was the machine shop and foundry owned by his uncle, and it was in this foundry that Jonathan Bartley earned his first few pennies by scraping casting with an old file. After attending a public and private school he entered Chester Institute, from which he graduated in 1876. His first inclination was in the direction of law, and he spent one year in a law office. But the mechanical traits of his family were too strongly embedded in his nature to be overcome, and he left law to take up the trade of millwrighting. It was about this time that the roller process made its advent in flour milling and this gave him an excellent opportunity to study the scientific methods of refining and separating. A thorough knowledge of these gave him a solid foundation to build on when he went with The Joseph Dixon Crucible Company, Jersey City, N. J., in the late 80's.

From one step to another he advanced to the position of Superintendent, with three divisions of the plant under his supervision, namely, crucibles, stove polish and refining. It was during his regime that a complete revolution in refining was made which put the Dixon Company on a plane that no other concern has ever reached. It was under his direction that their refining plant at Ticonderoga was remodeled. It was hard work, but he was young and the Dixon Company, then as now, was ready to recognize and compensate, which gave added incentive to push ahead. He often refers to that company as "the greatest business organization on earth." He left them in 1908 to build the Jonathan Bartley Crucible Company at Trenton, N. J.

In 1911 Mr. Bartley retired from the Trenton concern to go with the Bay State Crucible Company (then known as the Paige Retort and Crucible Company) at Taunton, Mass. He was president and he managed that plant until the beginning of the World War, when he resigned to build a refining plant of his own at Bartley, N. J. But before he had this completed, the Northwestern Terra Cotta Company of Chicago solicited his services to build a crucible plant for them in Chicago. He was reluctant to do this and refused several of their offers, but they finally suc-

ceeded in making a four-month contract with him which terminated in July, 1917, with the plant running in a very satisfactory manner. Mr. Bartley came back East thinking that his work was finished as far as crucibles were concerned, but a month or so later the Chicago people again solicited his aid in perfecting an organization, and he consented to give them one month. Seven months passed before he saw the sidewalks of New York again. At the time he left he was offered the choice of any office in the company and the privilege naming of his salary if he would stay with them, but his determination to "ease up" dominated and in June, 1918, he came back to Jersey and spent the summer rustivating among the haunts of his boyhood.

By this time his indefatigable energy made him restless and in 1919 he associated himself with the house of George F. Pettinos, as manager of their New York Importing office at 50 Church street. He spent three pleasant years with them and then a strong desire to retire came over him, with the result that he placed his resignation to take effect January 1, 1923. Soon after this the Asbury Graphite Mills decided to enter the importing field and Mr. Bartley was again "drafted." It required considerable influence from several sources to get him to consent to put on the harness again, but they succeeded and for the past five years he has been at his desk in the Hudson Terminal building.

Mr. Bartley is considered one of the best graphite experts in the United States and has acted in that capacity in many cases. He has written many articles on the subject that have been recognized by the Government. Whether his retirement is for "keeps" is a story to be told later on, because it is hard to keep a good man down.

**Dr. Walter Rosenhain, F. R. S.**, was recently elected president of the British Institute of Metals. He was born in 1875 at Melbourne, Australia, studied at Wesley College and the University of Melbourne where he was awarded a scholarship in 1891. In 1897 he came to England, where he entered St. John's College, Cambridge. Three years later he became scientific advisor to Chance Brothers, Birmingham, England, optical glass manufacturers. In 1906 he became superintendent of the metallurgy department of the British National Physical Laboratory. He is the author of a number of authoritative works on metallurgy.

**Herbert Hoover**, U. S. Secretary of Commerce, was appointed a member of the Endowment Committee for the Engineering Foundation and Engineering Societies Library, and its Executive Subcommittee. He has accepted this appointment. Mr. Hoover is a past president of American Institute of Mining and Metallurgical Engineers; Honorary member of American Society of Civil Engineers, and a member of the American Society of Mechanical Engineers, which with the American Institute of Electrical Engineers are the member bodies of United Engineering Society, maintaining Engineering Foundation and Engineering Societies Library.

**Samuel F. Dixon**, of William Dixon, Inc., manufacturers of jewelers' brushes, dental brushes, platers' and silversmiths' brushes, of Newark, N. J., was unanimously elected president of the American Brush Manufacturers' Association at the concluding session of their eleventh annual convention at Atlantic City, N. J., on Friday, March 23rd. Mr. Dixon succeeds the late **William Cordes**, president of the pro-phy-lac-tic Brush Company, Florence, Mass., who continuously served as head of the American Brush Manufacturers' Association from its organization until his death on February 1, 1928.

**Benjamin Freeman, B. A., M. A., Ph. D.**, has been appointed director of the research staff of the National Chromium Company, New York. Dr. Freeman has had wide experience both as an instructor of chemistry and as a research chemist on industrial problems. He was formerly Fellow of the National Research Council at Washington, D. C., faculty member of the science departments of both Amherst College and Western Reserve University, and recently associated with Doctor Raymond F. Bacon, the well known chemical engineer.

**T. F. Scannell** has been appointed exclusive representative by the Magnetic Manufacturing Company, Milwaukee, Wis., on a complete line of magnetic separation equipment, magnetic

clutches for power transmission, etc. Mr. Scannell's office will be located at 502 Ambassador Bldg. Mr. Scannell was formerly connected with the Chain Belt Co. of Milwaukee and his experience as an engineer will enable him to give those interested in problems of magnetic separation, prompt and efficient service.

**William B. Updegraff**, has been elected vice-president in charge of sales of the Watson-Stillman Company, New York, makers of hydraulic machinery. For the last fifteen years Mr. Updegraff has been engaged in various engineering and sales capacities with this company. He is a member of the Harvard Engineering Society, the American Society of Mechanical Engineers, the Harvard Club of New York and the Machinery Club of New York.

**F. W. Manker**, vice-president of the Surface Combustion Company, Toledo, O., delivered an address on "The Selection of Industrial Furnaces" before a meeting of the Syracuse, N. Y., chapter of the American Society for Steel Treating, on March 13, 1928. The meeting had probably the largest attendance the Syracuse chapter meetings have ever enjoyed, indicating the keen interest of manufacturers in fuels and furnaces.

**R. G. Abbey** has been appointed New York district manager for The W. W. Sly Manufacturing Company, Cleveland, O., and will maintain offices at 30 Church Street, New York City. He will handle a complete line of foundry cleaning room equipment. Purchasing is done entirely from the Cleveland offices, the New York office being for sales exclusively.

**Edward J. Cornish**, president of the National Lead Company, New York, recently displayed that his interests are not in metals alone. His purebred Jersey cow, Fon Owlet, has been adjudged the 305-day world champion Jersey in the

junior two-year-old class. She produced 656 pounds of butter fat and 12,874 pounds of milk in the period.

**E. G. Jarvis** has just been unanimously elected chairman of the metal division of the National Association of Waste Material Dealers, Inc. Mr. Jarvis is president of the Niagara Falls Smelting and Refining Corporation, President of the American Boron Products Company, and chairman of the board of directors of the Ladle Ring Corporation of America.

**Charles L. Newcomb**, works manager, Deane Pump Works Division of Worthington Pump and Machinery Corporation, Holyoke, Mass., has resigned and gone to St. Petersburg, Florida, for the winter. He is succeeded by **Hugh Benet**, formerly with the Bartlett Hayward Company, Baltimore, Md.

**Jacob F. Savelle**, a graduate of the University of Michigan and a man of wide practical experience, has been appointed welding service manager in the Detroit district by The Lincoln Electric Company, Cleveland, O. He will be under the direction of **J. M. Robinson**, Detroit district sales manager.

**Walter Abate**, son of the late Walter L. Abate, who died on February 20, 1928, has taken charge of the brass finishing shop operated by his father at 2085 Clark Avenue, Detroit. A report of the late Mr. Abate's career was published in the March issue of our journal, page 140.

**H. E. Haring**, for the past nine years engaged in electrochemical research at the U. S. Bureau of Standards, has joined the Research Staff of the Victor Talking Machine Company, Camden, N. J.

**George B. Michie** has been appointed western representative of the Niagara Falls Smelting and Refining Company, Buffalo, N. Y. Mr. Michie will maintain headquarters at Chicago, Ill.

## Obituaries

### Daniel Kennedy

Daniel Kennedy, president of The Kennedy Valve Manufacturing Company, died at Hot Springs, Arkansas, on January 14, 1928, after a short illness.

He was in his eightieth year, came to America from Ireland as a youth of seventeen, and was a self-made man in every sense of

the word. In the trade, as well as in his home city, he was highly esteemed and a leading industrial figure. He had the distinction of originating and for half a century guiding the destinies of a firm that is today recognized internationally as a pioneer and leading builder in the valve, fire hydrant and fittings field.

Mr. Kennedy's first business venture was in connection with the old Boston Dry Dock, built in the Erie Basin, Brooklyn, N. Y., in 1877 and now owned by Robbins Dry Dock and Repair Company. The valve equipment for controlling the flow of water in and out of this dock was an important factor in its operation. In competition with designs submitted by

valve builders of that period, those of Mr. Kennedy were chosen and he was awarded the contract for building the gate valves in sizes ranging from 48-in. down.

These valves, located at the bottom of a 35-ft. pit, were placed on time, met every requirement and even today are still functioning perfectly and to the entire satisfaction of engineers now in charge.

This contract established the firm of Daniel Kennedy with very small shop in New York City. The merit of the Kennedy designs and products was quickly recognized and the business grew to occupy a four-story building. By 1890, greater manufacturing facilities were required and the plant was moved to Coxsackie, N. Y. The firm was then incorporated and the name changed from Daniel Kennedy to The Kennedy Valve Manufacturing Company. Continued rapid expansion required a second move in 1907, at which time the present large modern plant occupying 20 acres was built in Elmira, N. Y. Many of the veteran employees moved their families to Elmira in order to continue with the firm. In 1921, an additional 15-acre plant nearby was acquired for independent production of the malleable-iron pipe fitting lines which were introduced at that time.

Many valve and fire-hydrant design features of the now accepted general standards were originated by Mr. Kennedy, and it is said that none of his designs ever had to be retired through failure in performance.

### John Swift Holbrook

John Swift Holbrook, former president and, at the time of his death, a director of the Gorham Manufacturing Company, passed away on March 6, 1928, as the result of a cerebral hemorrhage. He lived in Providence, R. I.

Mr. Holbrook was born in Boston in 1875, the son of the late Edward Holbrook, who had also been a president of the Gorham Manufacturing Company. In 1896, J. S. Holbrook graduated from Harvard and entered the employ of the Gorham company. He became vice-president in 1906, and after the death of his father in 1919 he was elected president. In 1921 he retired from active business, but remained a director of the concern.



DANIEL KENNEDY

trolling the flow of water in and out of this dock was an important factor in its operation. In competition with designs submitted by

### John J. Treat

John J. Treat, several times mayor of Stamford, Conn., and assistant superintendent of the padlock department of the Yale and Towne Manufacturing Company, Stamford, passed away on February 7, 1928, at the age of fifty-five.



JOHN J. TREAT

His progress as an industrial executive was parallel to a very wide local influence in politics, and he was thrice elected mayor of the city of Stamford, in which capacity he displayed enviable ability and energy as a servant of the public. He served from 1916 to 1922, gaining the gratitude of the whole city when, during the coal famine in 1922, he managed to keep the city well supplied with fuel. He also distinguished himself during the war, when he did a great deal for service men and their families.

### Wilfrid A. Horton

Wilfrid A. Horton, assistant engineer at the Ajax Electro-thermic Corporation, Ajax Park, Trenton, N. J., was killed in an accident on February 6, 1928. He was twenty-six years of age and left a widow, Mrs. Gwendolyn Phillips Horton, with whom he had come from England at the time he made his connection with the Ajax company, some eighteen months previous to the unhappy accident which took him away.

Mr. Horton had been a highly valued and esteemed member of the technical staff of the Ajax company. Previous to his acceptance of that position he had been a radio expert, in Britain and in other countries. He was credited with having installed radio sending and receiving stations in many parts of the world, in addition to having been an inspector of such stations for a considerable period. Of his work with the Ajax company, E. F. Northrup, vice-president and technical advisor of that firm, with whom Mr. Horton worked, has to say the following:



WILFRID A. HORTON

"In the eighteen months of his association with me, I discovered a rare and unique personality. His friends knew this and his acquaintances suspected it. Mr. Horton possessed in very large measure all the characteristics which I conceive to be of importance as the possession of any young man entering upon an engineering career. His character was revealed by a rare dependability, a steadfastness of purpose, a hatred of "slackers," and an imagination which always saw the worthwhileness of better things. He had a winning personality which combined self respect without vanity or aloofness. He had great capacity for work which he always put through with exceptional dispatch. He had initiative with endless ability to devise means of getting out of difficulties so a job always was satisfactorily completed.

"He was a student of his subject and knew alternating currents

with clear physical concepts to which he added the ability to get quantitative results with vectors and mathematical analyses. He had the faculty to sense the essential aspects of any problem and he handled all his problems with rare good sense. This young man was a very able helper whose loss will always cripple the progress of our work. But more than this, his going leaves a profound sorrow in his home and in many hearts and not the least in mine."

### Charles H. Woodison

Charles H. Woodison, vice-president of the E. J. Woodison Company, Detroit, Mich., and vice-president of the Canadian Foundry Supply and Equipment Company, Toronto, Canada, died the latter part of January, 1928. Mr. Woodison was fifty-two and had been ill about three weeks.

Charles H. Woodison was born in Windsor, Ontario, September 27, 1876. Before joining his brothers in 1911, he was for a long time connected with the Malcomson Coal Company, with which company Senator James Couzens was affiliated before joining Henry Ford.

At the inception of the Woodison company Mr. Woodison joined his brothers, taking the office of vice-president. When the company decided to extend its business to Canada in a large way in 1914, C. H. Woodison was made vice-president of the new company as well as managing director. From 1914 until 1926 Mr.



CHARLES H. WOODISON

Woodison was very active in the affairs of the company in Canada, being in touch with a great deal of the trade there personally.

In 1926 the E. J. Woodison Company, Ltd., merged with the Canadian Foundry Supply Company of Montreal and Mr. Woodison was made vice-president of the new company resulting from the merger, namely, The Canadian Foundry Supply and Equipment Company, which office he held at the time of his death.

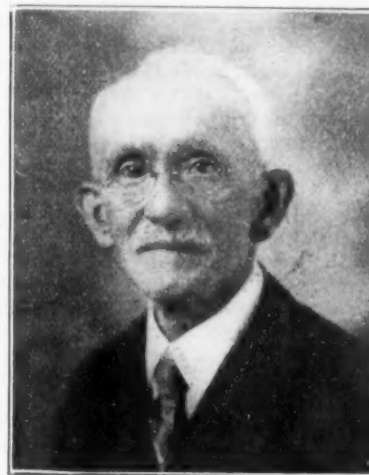
Mr. Woodison was a member of various Masonic fraternities, being a charter member of City of the Straits Lodge, Detroit. He is survived by his wife, Mrs. Frances Woodison, his sister, Mrs. J. B. Carmichael, and his brothers, Edward J. Woodison and John C. Woodison.

### Marshall K. Thomas

Marshall K. Thomas, foreman plater of the Wilcox Silver Plate Company, a division of the International Silver Company, at Meriden, Conn., passed away on March 16, 1928, at his home, 231 South Main Street, Wallingford, Conn. He was 54 years of age and widely known in Connecticut as a genealogist, antiquarian and horticulturist.

Mr. Marshall was a pioneer in electroplating, being an expert on silver and gold work. He was with the Wilcox concern before it became a part of the International Silver Company, and throughout the many years of his service he was always highly valued by his firm. While his friendship extended over many parts of New England, Mr. Thomas never sought public office, and only last January was he persuaded to engage in any sort of political activity, when he became chairman of the Wallingford Park Board. His death brought forth many expressions of sorrow from those who had prized his friendship.

Mr. Thomas is survived by his widow, two daughters and a son.



MARSHALL K. THOMAS

# News of the Industry

## Industrial and Financial Events

### Employees Buy Wolff Company

Thirty-five department heads, executives and foremen of the Wolff Company, \$7,000,000 plumbing fixture corporation founded in Chicago, Ill., in 1855, have taken over the business. Gradually every member of approximately 1,000 employees will be given an opportunity to share in the profits of the company. According to the announcement, William J. Woolley, new president of the corporation, was a plumber in Evansville, Indiana, twenty years ago. He saw that plumbers were not trained as business executives and started a bureau to train master plumbers in business administrations. He came to the attention of the Wolff Manufacturing Company and three years ago was brought to Chicago to aid in the conduct of the business.

Associated with Mr. Woolley in the official management is William T. Mahoney, vice-president in charge of production, who began his career as an apprentice in a foundry. Other leading employees include Henry I. Warden, vice president; Arthur H. Jolliffe, secretary; and O. P. Decker, former instructor in economics at the University of Chicago, treasurer.

### Says There Is No Tin Substitute

Replying to a question in regard to current reports as to a possible "tin famine," President Phelps, of the American Can Company, one of the largest users of tin plate, said in part:

"Our information does not entirely bear out some of the statements current in the newspapers that the world's supply of pig tin is in immediate danger of exhaustion.

"While we have made, and shall probably continue, experiments looking to the use of some cheaper substance in place of pig tin, I cannot say that these experiments have been prompted by any immediate dread of the loss of this material.

"If something just as good and considerably cheaper could be found, it would be economically desirable, but I must confess that thus far no such substitute for coating steel plates that are to be used in closing food products has been found."

### Electric Refrigeration Show

There was fine display of the products of the leading manufacturers of refrigerators for home and industrial use at the third annual Electric Refrigeration Show, held from March 19 to 31, 1928, at the rooms of the New York Edison Company, 130 East Fifteenth Street, New York City. Innovations have been made in the matter of colored finishes to take the place of the conventional white enamels that have always been in greatest use. There are now refrigerators coated with red, green, blue, gray and other colored enamels. It is notable that many of the manufacturers are using a large amount of plated parts in their products. Many models are being decorated with plated angle bars along the edges and corners, and hinges largely are plated with nickel. Some of the interiors displayed plated gratings used for shelves.

### Mexican Metal Output Larger

In spite of notices of an alarming nature regarding the decadence in production of metals within the Mexican Republic, production was increased during the year 1927, says Excelsior, a Mexican journal.

In spite of stoppages of work, Excelsior claims, the total metal production in Mexico showed a distinctly upward tendency during 1927, and statistics issued from the Department of Industry and Commerce are quoted in corroboration.

### Goetz Brass Changes Name

The Goetz Brass Company, Chicago, Ill., manufacturers of bath, shower and lavatory fixtures, as well as special brass products, has changed its corporate name to H. E. Robertson Company. The new name was adopted due to a change of ownership.

### Roessler and Hasslacher Election

There was a meeting of the stockholders and of the directors of the Roessler and Hasslacher Chemical Company, New York, on March 6, 1928, at which the following directors, executives and committees were elected.

Board of Directors: W. A. Hamann, chairman; Dr. H. R. Carveth, P. Schleussner, M. Kutz, Dr. M. J. Brown, C. Dill, A. Frankel, G. E. Warren, J. M. Gifford. Executives: Dr. H. R. Carveth, president; P. Schleussner, first vice president; M. Kutz, second vice president; Dr. M. J. Brown, assistant vice president; C. Dill, assistant vice president; A. Frankel, treasurer; A. Heuser, assistant treasurer; P. S. Rigney, secretary. Executive Committee: Dr. H. H. Carveth, P. Schleussner, M. Kutz, Dr. M. J. Brown, C. Dill, A. Frankel.

### Conference on Coated Abrasives

A general conference of consumers, technical experts, distributors, and manufacturers interested in coated abrasive products will be held at the Department of Commerce, Washington, D. C., April 11, 1928, to consider drafting a simplified practice recommendation for this commodity, according to the Division of Simplified Practice. For a number of years the quantity of sizes and varieties of abrasive paper and cloth has been increasing at a rapid rate. The Abrasive Paper and Cloth Manufacturers Exchange has requested that the Division of Simplified Practice call a general conference of all interests to consider the adoption of a simplified practice recommendation.

### Immense Bell for New Church

At Croydon, England, on March 3, two thousand bell ringers from all parts of England, all members of the Guilds of Bell Ringers, and many British church dignitaries heard the first ringing of a set of huge carillon bells which will be installed in the new Baptist Temple on Riverside Drive, New York City, built by virtue of donations of John D. Rockefeller, Jr. The bells, produced at the Croydon brass foundry, which is famous for its bell making, included one weighing 18¼ tons, the largest ever tuned for chiming and the fourth largest of all the bells in existence. The carillon will be otherwise remarkable in that it will be able to produce five octaves.

### General Electric Earnings

Earnings of the General Electric Company for 1927 amounted to \$48,799,488, equivalent, after dividends on the special stock, to \$6.41 a share on the 7,211,481 shares of no par common stock, according to the annual report of the company. This compares with \$6.14 a share in 1926.

Orders received during the year 1927 were \$309,784,623, compared with \$327,400,207 in 1926, a decrease of 5 per cent. and unfilled orders at the end of the year were \$68,916,000, compared with \$72,297,000 at the close of 1926, also a decrease of 5 per cent.

### Canada's Aluminum Exports Gain

The exports of aluminum from Canada in 1927 were more than double those of the previous year, being 23,170 tons, valued at \$10,544,195, against 11,240 tons, valued at \$5,900,547 in 1926 according to official reports from London. Aluminum now takes fifth place in the value in the exports of non-ferrous ores and smelter products from Canada.

### National Lead Company Income

The net earnings of the National Lead Company for 1927 were \$4,929,396 after all expenses and reserves. This compares with net earnings of \$9,004,567 in 1926.

### New Nickel Company Directors

Three new members have been elected to the board of directors of the International Nickel Company, as follows: Lord Weir, Eastwood, Glasgow, Scotland; James A. Richardson, Winnipeg, Canada; J. W. McConnell, Montreal, Canada. This has considerably increased the number of English and Canadian members and it is rumored in financial circles that control of the company may finally pass to the foreign interests.

### Large Telephone Expansion Planned

American Telephone and Telegraph Company for the year 1927 will spend two billion dollars the next five years for construction to provide for further expansion of service as well as further improvements in the service. During the last five years expenditures for additions, betterments and replacements have amounts to \$1,800,000,000.

### Federated Metals Corporation

Federated Metals Corporation, New York, reports for the fiscal year ended November 30, 1927, net profits of \$349,169, as compared with net loss of \$480,491 in the preceding year. President B. Lissberger stated that the improvement was due to practical application of measures adopted last year to adjust inventory losses and fluctuations of earnings.

### Crane Company Profits

Net income of the Crane Company in 1927 was \$6,693,160, after interest, depreciation, Federal taxes and other charges. This compares with \$9,250,957 in 1926.

### Worthington Pump Income

The report of the Worthington Pump & Machinery Corporation and subsidiaries for the year ended December 31, 1927, shows net income of \$600,343 after depreciation, etc., as compared with \$365,633 in 1926.

### Walworth Company Profits

Net profit of the Walworth Company and subsidiaries for the year ended December 31, 1927, was \$384,709 after interest, depreciation, Federal taxes, etc. This compares with \$561,908 in 1926.

### Neptune Meter Company

Net income of the Neptune Meter Company for 1927 was \$779,369 after all charges and Federal taxes, comparing with \$896,402 in 1926.

### Savage Arms Corporation

Report of the Savage Arms Corporation and subsidiaries for the year ended December 31, 1927, shows net income of \$323,254 after depreciation, Federal taxes, etc. This comes with \$627,465 in 1926.

## Incorporations

**Houston Brass Products**, New York City, with \$10,000 capital; J. Grumet, 271 Madison Avenue, incorporator.

**Simpson Sheet Metal Works**, New York City, with \$10,000 capital; incorporator, J. Rubin, 305 Broadway, New York.

**Rockledge Foundry Corporation**, New York; to manufacture bronze and iron products; capital, \$5,000; S. A. Syme, Mount Vernon, N. Y., attorney.

**Hallman, Inc.**, New York City, has been organized to manufacture jewelry, with capital of \$10,000. Incorporators are Monifried and Warner, 1440 Broadway, New York.

**Sharfman's, Inc.**, Worcester, Mass., to manufacture jewelry; capital \$100,000; incorporators, Nathan Sharfman, Worcester; Edward M. Schwartz, Brookline, Mass.; Nellie L. Sopkin, Boston, Mass.

**Hamilton Diuguid, Inc.**, Brooklyn, N. Y., has been organized to engage in iron and brass foundry business. Capital's is \$20,000. Incorporator's attorney, F. J. Parks, 55 Liberty Street, New York.

**Rex Metal Manufacturing Company**, Pittsburgh, Pa., incorporated with \$5,000 capital, will manufacture brass and other metal products. Incorporators, Maurice Levaur, 6514 Bartlett Street, Pittsburgh.

**Samuel A. Movitz Company**, Salt Lake City, Utah, to manufacture and wholesale jewelry; capital \$50,000; Directors: Samuel E. Movitz, president; Edith Movitz, vice-president; Harold King, secretary-treasurer.

**Mullenbach Electrical Manufacturing Company**, 116 East

16th Street, Los Angeles, Cal., will manufacture switchboards, panel boards, cabinets and electrical control apparatus. Company is operating a newly completed plant.

**Atlas Pattern and Manufacturing Company**, Detroit, Mich., has been incorporated with capital of \$10,000 to manufacture wood and metal patterns, dies and models. Incorporator: William Landless, 3975 Montclair Avenue, Detroit, Mich.

**Bridesburg Foundry Company**, Bridesburg, Philadelphia, Pa., has been reincorporated under Pennsylvania laws. Company manufactures brass, bronze and aluminum castings and will make no changes either in management or in operations.

**Jones-Fulton Corporation**, Buffalo, N. Y., has been organized to engage in manufacture of metal products and will establish a plant and start operations soon. The incorporators are Evan E. Jones, 31 North Ryan Street, Buffalo, and Clarence D. Fulton, 20 Hubbell Avenue.

**American Brass and Aluminum Casting Corporation**, 216 Columbia Street, Portsmouth, Va., has been formed with capital of \$300 to \$50,000. Officers are W. I. Overstreet, president; E. H. Owens; and J. M. Carson. The firm will deal in all kinds of metals and castings.

**Chicago Engraving and Embossing Company**, 322 West Washington Street, Chicago, Ill., has been incorporated with capital of \$5,000, to engage in engraving, embossing and stamping copper, brass and steel dies, etc., by E. A. Berenger, A. C. Chapman and C. A. Levine. Correspondent is Charles A. Levine, First National Bank Building, Chicago.

## Business Reports of The Metal Industry Correspondents

### New England States

#### Waterbury, Conn.

April 2, 1928.

Publication of the Waterbury tax list for this year shows that the three largest brass companies are still the city's biggest taxpayers. This year, the **Scovill Manufacturing Company** heads the list, having stepped ahead of the **American Brass Company**, which was formerly the highest. The assessed valuations made by the city are as follows:

**Scovill Manufacturing Company**, \$13,843,135, of which \$6,145,870 represents real estate and \$7,697,265 personal property; **American Brass Company**, \$11,844,600, of which

\$5,640,000 is real estate and \$6,204,000 personal property; **Chase Companies, Inc.**, \$10,123,025, of which \$4,522,050 is real estate and \$5,600,975 is personal property. Of course the **Scovill** assessment includes the former **American Pin Company** and part of the plant of the former **Oakville Company**. The **American Brass** assessment naturally does not include its holdings elsewhere. The **Waterbury Clock Company** assessment is \$4,054,000, of which \$1,452,800 is real estate and \$2,601,200 is personal property. The **Waterbury Farrell Foundry** stands fifth on the list with an assessment of \$1,852,500. The **Scovill Company**, **American Brass** and **Chase Companies** together pay more than one-fifth the city's taxes.

In order to retain the corporate name and prevent any new concern from incorporating under it, the **Scovill Manufacturing Company**, through agents, has incorporated a new **American Pin Company**. The old **American Pin Company** was acquired by the **Scovill** company, some years ago and its corporate existence dissolved. Since then the plant has been operated as the **American Pin Division** of the **Scovill Manufacturing Company**. The new concern has an authorized capital of but \$2,000 and its incorporators are **Judge Francis T. Reeves**, the **Scovill** company's legal representative and two of the latter's clerks. It will not pursue operations. **L. P. Sperry**, secretary of the **Scovill Manufacturing Company**, denies that the concern has leased the former **Matthews and Williard** plant to an out of town concern.

In the tower clock of the new library of the University of Louvain, Belgium, to be dedicated July 4, 1928, each of the four clock dials will contain 12 stars, representing the 48 states. The stars will be composed of aluminum bronze contributed by the **American Brass Company** through its technical superintendent and metallurgist, **William H. Bassett**, who is vice-president of the **American Institute of Mining and Metallurgical Engineers**. The clock is being given by American engineering societies, as is also a carillon.

The **Carroll Wire Company** has filed a voluntary petition in bankruptcy. Assets are given at \$48,686 and liabilities at \$57,125. The plant is located in Brown's Meadows. The officers are: President, **P. H. Carroll**; vice-president and treasurer, **Vincent J. Carroll**; secretary and assistant treasurer, **P. H. Carroll, Jr.**

The former plant of the **Connecticut Brass and Manufacturing Corporation** has been sold to the **Waterbury Cadillac Company** and will be turned into showrooms for the latter and a number of other local automobile agencies, the long rolling mill being particularly adapted for such purpose. The former **Connecticut Brass and Manufacturing Corporation** went into bankruptcy after the World War and its plant was bought at a bankruptcy sale by Bridgeport interests who sought for some time to sell it.

The **American Fastener Company** of this city has purchased the garter trimming business from **Warner Brothers** of Bridgeport. They will move it to this city and install it in a large addition now being built. It is expected that this will increase the company's production one-third and that over 100 additional hands will be required.

Trinity college has had presented to it a clock made by the **Waterbury Clock Company** in 1850 which it will install in one of its new buildings. The clock bears a representation of the original college buildings.

Fourteen industries are represented in the newly formed **Industrial Foremen's Club**. **George O'Donnell**, of the **American Brass Company**, has been elected president and the executive committee consists of: **Fred Knapp** of the **Waterbury Manufacturing Company**, **George Hubbard**, of the **Scovill Manufacturing Company**, **William D'Hautville**, of the **Waterbury Steel Ball Company** and **Michael J. Wall** of the **Steele and Johnson Manufacturing Company**.

More than 1,100 **Scovill** employees attended the annual **Scovill Manufacturing Company** get-together at the Y. M. C. A., on March 16.

**Edward O. Goss**, president of the **Scovill Manufacturing Company**, who was operated on for appendicitis last month, is now convalescing and is expected back at business within a few weeks.

Statements issued by **F. I. Jones**, of the **United States Employment Service** at Boston, relative to business conditions in this city are disputed as incorrect by the local **Chamber of Commerce**. The report stated that there is a slight surplus of labor here, all plants running part time or with reduced forces and no building of any size underway. In answer the **Chamber of Commerce** quotes the eight leading plants as saying that in each case some of their departments are running on full time and where they are not it is merely because of the usual seasonal depression. With regard to building operations it is mentioned that the **American Fastener Company** is building an addition that will increase its plant one-third. It was also pointed out that the **Beardsley Manufacturing Company** has purchased the **Frank Wolcott Manufacturing Company** of Hartford and is to move it

here. The local branch of the state employment bureau reports that it cannot fill the demand for skilled workers.

**J. W. Potter**, of the **Randolph-Clowes Company**, was elected treasurer, and **F. F. Seidel**, of the **Waterbury Steel Ball Company**, was elected a member of the executive committee at the annual meeting here of the Connecticut branch of the **National Association of Purchasing Agents** last month.—**W. R. B.**

## Bridgeport, Conn.

April 2, 1928.

One of the first acts of the **Bridgeport Brass Company** after its reorganization has been to recommend the increase of its stock by 1,500 shares, at a par value of \$100 each, making the number outstanding, 36,500. **Rowley W. Phillips** of **Waterbury**, one of the new directors denies positively that **American Brass** interests are attempting to get control of the company, that any other brass company is attempting to do so, and that any other company is involved in the recent reorganization. The rumor probably started from the fact that the new president, **Charles E. Beardsley**, was a superintendent of the **American Brass Company** for nearly 20 years and that the new general manager, **Ralph E. Day**, was superintendent of one of the **Waterbury** plants and later superintendent of the **Hastings** plant of the **American Brass Company**. Mr. Phillips also confirmed the statement in last month's **THE METAL INDUSTRY** that he represents as trustee the estate of the late **F. J. Kingsbury**, who owned more than one-third of the **Bridgeport** concern's stock. As previously stated, the **Hamilton** family, formerly of **Waterbury**, owns another third. The reorganization, it is understood, was effected by Mr. Phillips and the **Hamilton** family. The **R. F. Griggs Company** of which Mr. Phillips is an officer, has handled the financing of the **Beardsley Mfg. Co.** and its successor, the **Beardsley & Wolcott Manufacturing Co.** of both of which Mr. Beardsley is the president.

The **Remington Arms Union Metallic Cartridge Company** of this city has won its plea to the **United States Supreme Court** for a review of its case involving its request for payment of interest by the government in connection with war contracts, the interest amounting to \$330,000. The **Court of Claims** last year awarded the company its claim for \$646,000 involved in these contracts but did not award interest. The dispute was over the price of conversion service on raw materials which the local concern was purchasing from the **American Brass Company** for cartridge cases. The latter in 1919 took back from the local concern two payments totaling \$646,000 because of increases in the costs of raw material.

The **Board of Aldermen** has voted to sell to **General Electric Company** about 25 acres on the east side of the town farm for \$25,000. The land will be used for the building of warehouses. As the property adjoins the railroad it is expected that a siding for shipping will also be built. The vote is the result of negotiations that lasted over a year.

**Alpheus Winter**, manager of the **Bridgeport Manufacturers' Association**, declared at a dinner of the association last month that **Bridgeport's** industrial condition is well in the lead among the country's cities, surpassing **New Haven** and **Hartford** in this state.

**General Electric Company** is fighting a federal patent bill which would require for forfeiture of patent rights in cases of conviction under the laws prohibiting monopoly. The company brands as false certain statements that its incandescent lamp patents have expired and that the company has employed oppressive tactics against independent smaller manufacturers.—**W. R. B.**

## Connecticut Notes

April 2, 1928.

**NEW BRITAIN**—**Landers, Frary & Clark** directors, at their meeting last month, declared dividends of 12 per cent for 1928, three per cent to be paid quarterly. **Richard D. White** was elected treasurer to succeed **Pardon C. Rickey**, who recently resigned.

Directors of the **American Hardware Corporation** declared dividends totalling 16 per cent for 1928 at their meeting last

month, four per cent to be paid each quarter. It is an innovation for the concern to declare an entire year's dividends in advance. The directors elected **Isaac Black** vice-president and manager of the **Russel and Erwin** division, filling the vacancy caused by the recent death of **B. A. Hawley**. The stockholders elected **Wilbur P. Bryan**, who is president of the **Colonial Trust Company** of Waterbury, a director, filling the vacancy created by the death of **Harris Whittemore** of Naugatuck.

**Philip Diehl** of Church street last month celebrated the fifty-fourth anniversary of his entering the employ of the **Stanley Rule and Level Company**, where he is still employed in a supervisory capacity. At one time he had charge of the first automatic screw machine operated at the shop.

The **Union Manufacturing Company** has declared a quarterly dividend of  $1\frac{1}{2}$  per cent. This is a cut of 1 per cent.

Vice president **Walter H. Hart** will represent **Stanley Works** and **A. G. Kimball** will represent **Landers, Frary and Clark** at the **American Institute of New York** this month. The gathering is limited to representatives of concerns who have been awarded prizes at industrial fairs held in New York during the last century. The gathering will be held at the **Waldorf-Astoria**.

**Charles F. Smith**, chairman of the board of directors of **Landers, Frary and Clark**, has presented St. Mark's Church with two building lots.

**BRISTOL**—A thousand gallon tank of hydrogen in the welding department of the **Horton Manufacturing Company** exploded on March 20 with a concussion that rocked the territory within a mile of the plant. Luckily no one was injured as the explosion occurred at night and no one was near, even the watchman being in another part of the plant. All the windows on the lower floor of the plant were blown out, a heavy door was blown off its hinges, and considerable damage was done to the equipment. A fire followed the explosion but was put out by the automatic sprinklers before the fire apparatus arrived.

**New Departure Manufacturing Company** has announced the appointment of **Robert E. Clingan** of Toledo to the post of assistant to **Lester G. Sigourney**, secretary and sales manager of the concern. He has been connected with the **Hess-Bright Manufacturing Company**, the **Bock Ball Bearing Company** and the **Timken Roller Bearing Company**. He will move here this month. **Harold W. Cleveland** of Terryville has been appointed to the advertising department of the company.

Members of the **Merchants Bureau** of the **Chamber of Commerce** at their meeting last month inspected the plant of the **E. Ingraham Clock Company**.

**Bristol Brass Company** reports an improvement in business conditions. Many of its workers are putting in 70 hours a week. None of the local factories are experiencing any slump. **Secretary L. A. Wheeler** of the **Chamber of Commerce** reports; also that the **Wallace Barnes Company** shipped out more than one million pounds of goods during February, smashing all previous records for February of any year and establishing a new record for Spring business.

**THOMASTON**—All last year's officers and directors were reelected at the annual meeting of the **Seth Thomas Clock Company** yesterday, as follows: President, **Seth E. Thomas**; vice president, **Mason T. Adams**; secretary, **B. W. Weathers**; treasurer, **Arthur Hamlin**.

The company's statement for 1927 shows that 8 per cent was paid on the common and 7 per cent on the preferred. A large amount was spent for exterior and interior improvements. Ground will be broken within a few days for a new addition to the company's factory on South Main Street. The addition will be four stories high, 100 by 60 feet. Workmen of the **Seth Thomas Company** have been sent to New York City to repair the hands of the clock on the **Paramount Building** at Times Square, the clock having been originally built by this concern.

**TORRINGTON**—The **Torrington Company** directors have declared the regular quarterly dividend of three per cent payable April 2. In the last five years the company has retired \$1,000,000 preferred stock and written good will down \$1,966,278. During that period the company has paid out \$24.75 a share of revealed earnings of \$27.47 a share.

The reorganization of the **Industrial Council** last month

resulted in the following new council: **Sal Rubino** and **Walter Ffistner** of the **Torrington Manufacturing Company**; **Einar Palm** and **F. Edwards** of the **Turner and Seymour Company**; **Humbert Borzani** and **Emanuel Rubino** of the **American Brass Company**; **W. Hoysdard** and **Irving Mills** of **Hotchkiss Brothers**; **James Kelly** and **John Brown** of the **Union Hardware Company**; **Edward Didier** and **Ernest Novey** of the **Torrington Company**; **William Krause** and **James Quinn** from the **Fitzgerald Manufacturing Company**.

**Tiley and Pratt Company** of Essex, recently acquired by **The Torrington Company**, is now operating on a 24 hour a day schedule with three shifts, and the building of an addition there in the spring is under consideration.

**MERIDEN**—Last year's officers of the **International Silver Company** were reelected at the annual meeting held last month.

**Manning, Bowman and Company** has declared an initial dividend of  $12\frac{1}{2}$  cents a share on its Class B stock and the regular quarterly dividend of  $37\frac{1}{2}$  cents on the Class A stock, both payable April 1. The annual statement shows net earnings of \$202,829 for 1927 compared to \$187,071 for 1926 and \$114,735 for 1925.

**NEW HAVEN**—**Leonard S. Taylor** has retired as vice president in charge of production for the **Acme Wire Company**. **Edgar L. Hartpence** has been elected vice-president and has taken over the duties of general manager from **President Victor M. Tyler**.

The **New Haven Clock Company's** statement for 1927 shows an increase in the surplus account of \$208,974 after setting up special reserves of \$20,000 and payment of 7 per cent on its preferred stock, and 8 per cent on common stock.

**HARTFORD**—Stockholders of the **Billings and Spencer Company** have been requested to deposit their common and preferred stock with stockholders' protective committees and receive trust certificates in their place.

**WINSTED**—Patent rights on a spring socket and a temperature indicating device for waffle irons have been granted to **Ledwig Reichold** of Winsted, who has assigned them to the **Fitzgerald Manufacturing Company**. The **Hendey Machine Company** has registered a trade mark on lathes, shapers, milling machines and centering machines.

**MIDDLETOWN**—The **Russell Manufacturing Company's** production for the first three months of this year ran from 7 to 10 per cent ahead of the corresponding period a year ago, the officials state. The initial quarterly dividend of \$1.50 a share, declared in January and which placed the stock on a \$6 annual basis, will be continued, **President T. Macdonough Russell** states, and it is possible a small extra will be declared at the end of the year.—W. R. B.

## Boston, Mass.

April 2, 1928.

As a result of the campaign by the **New England Council** to secure greater use of color in New England products, **Whiting and Davis Company**, of Palmyra, Mass., manufacturers of silver and other metal mesh bags have increased their sales 60 per cent during the past year by the use of an attractive series of colors combined with an aggressive sales campaign.

Aircraft of a lighter type featuring aluminum parts are to be manufactured complete for the first time in New England by the **Bourdon Aircraft Corporation**, at East Greenwich, R. I. **Allen P. Bourdon** is president and **Franklin T. Kurt** is secretary and treasurer. The plant will also make parts for airplanes. At the start a German motor is to be utilized, but the company will use a New England or at least some American make just as soon as one can be developed for their small light plane with around 90 h.p. The plane is being made to sell at about \$5,000.

A manufacturing building is to be erected at 24 Arlington Street, Watertown, Mass., for the **Peerless Pressed Metal Company**, of 14 Electric Avenue, Brighton, Boston. It will be of brick construction and one story.

Contract has been awarded for construction of a new plant for the **New England Metal Culvert Company** at Palmer, Mass.

The following are new incorporations in Massachusetts: **Stevens Pressed Metal Company**, Worcester; capitalized

with 300 shares of common stock no par; incorporators include **Elbert H. Carroll**, West Boylston, Mass.

**Modern Heat Treating Corporation**, Worcester; chartered with 300 shares of common stock no par; incorporators include is the annealing, treating, plating, light forging, etc., of bronzes and other metal; incorporators include **Samuel Stall**, treasurer, and **Benjamin Stall**, clerk.

**Libby Manufacturing Company**, Melrose, Mass.; chartered with \$60,000 capital stock; to manufacture jewelry, silver and enamelware; incorporators are **Edward W. Libby**, president, **Fred E. Williams**, vice president and **Kenneth J. Hermann**, treasurer, all of Melrose.

**Artistic Metal Letter Company**, Malden, Mass.; capitalization, \$25,000; under Massachusetts laws; by **Zachary Bronstein**, president and treasurer, Malden.

**Sharfman's, Inc.**, Worcester; chartered under Massachusetts laws with \$100,000 capital stock; to deal in and manufacture jewelry. **Nathan Sharfman**, Worcester, is president and treasurer.

**A. F. Bourque**, Holyoke; chartered with \$50,000 capital stock under Massachusetts laws; to deal in and produce jewelry. Members of company include **Alfred F. Bourque**, treasurer, of Holyoke, and **O. H. Bourque**, clerk, also of Holyoke.—H. A. L.

## Middle Atlantic States

### Trenton, N. J.

April 2, 1928.

Metal manufacturing concerns are not taking orders very briskly at this time and some have been compelled to lay off help. Few departments at the plant of the **J. L. Mott Company** are operating and there is no forecast when the big factory will be in full operation again. The **Westinghouse Lamp Company** here has received an order to manufacture 3,000,000 lamps to be used in theatres and for outdoor signs by a theatrical concern. This contract is the largest yet received by the **Westinghouse** company.

**Frederick Jewell** of New York City, inventor of radio receiving sets, was awarded \$25,000 by a jury in the **United States District Court** at Trenton in the suit for \$750,000 for alleged breach of contract brought against the **Splitdorf-Bethlehem Electric Company**, of Newark. The trial lasted two weeks before **Judge Rellstab**.

The plant of the **Billingham Brass Foundry**, South Clinton Avenue, Trenton, was damaged by fire recently. The flames spread from a smelter to nearby woodwork.

The following concerns have been incorporated here: **Rite Manufacturing Company**, Newark, 2,500 shares no par, to manufacture air valves. **Allen Chemical Company**, Pittstown, \$200,000, preferred and 18,000 shares no par, to manufacture chemicals. **Albanol Chemical Works**, Newark, \$10,000, to manufacture chemicals. **Try These Company**, Hasbrough Heights, \$100,000, to manufacture chemicals. **Lysie-Vita-**

**chrome Laboratories, Inc.**, 15,000 shares no par, to manufacture chemicals.—C. A. L.

### Newark, N. J.

April 2, 1928.

Adjudged in contempt of court, three electrical concerns charged with infringement of patents held by the **General Electrical Company** have been fined a total of \$2,000 by **Judge Bondine** of the United States District Court. The **General Electric Company** during January brought suit against the **Republic Electric Company, Inc.**, of Weehawken; the **Standard Lamp Works, Inc.**, of Newark, and **Henry Schupka**, of Newark, contending that patents on incandescent lamps were being infringed. The court rendered a decision in favor of the **General Electric Company** and issued a decree enjoining the three defendant companies from further manufacture of the certain types of lamps involved. No attention was paid to the decree, it is claimed, and the contempt action was taken. A fine of \$1,000 was imposed upon the **Republic Electric Company** and \$500 each upon the other companies. Being adjudged guilty of contempt in civil suits, the fines must be paid by the defendants to the plaintiff.

The following Newark concerns have been chartered: **Standard Blower and Manufacturing Company**, \$100,000, to manufacture exhaust fans. **Ludwig Zimmer**, 100 shares; refining minerals. **United Refining Company**, \$10,000, refining metals. **Bower Ore Corporation**, \$100,000 preferred and 500 shares common, deal in ores.—C. A. L.

## Middle Western States

### Detroit, Mich.

April 2, 1928.

The non-ferrous industry has shown considerable improvement during the last 30 days and the outlook is now more favorable for still further improvement. The manufacture of plumbers' supplies is reported to be somewhat better and as building conditions become better, increased production may be expected. It is apparent from every source that manufacturing in the non-ferrous metal lines will make a better showing during the next few months than it did for the same period a year ago. The motor car industry is now engaged in seasonal production, and while it is not up to former years, it will do better than in 1917. This, of course, has a decided bearing on brass, copper and aluminum for so much of these metals are used in the production of motor cars. Particular thought should be given to the **Ford Motor Company** at this time. The two plants in the Detroit territory are now employing 95,000 persons, with a gradual increase reported from day to day as production continues to expand. Taking everything into consideration, the non-ferrous industry in the Detroit territory has a favorable outlook for the greater part of the coming summer.

**General Porcelain Enameling Corporation** was recently incorporated at Wyandotte, with a capital stock of \$43,000. It will manufacture porcelain enamel and do a general manufacturing and stamping business. The owners are **Thomas F. Chawke**, **Elmer A. Conway** and **Thomas H. Conway**, 53 Chicago Boulevard, Detroit.

**C-F Plating Company** has been incorporated in Detroit. It

will engage in the business of electroplating, etc. The incorporators are **Eileen Faas**, **W. M. Coffman** and **Henry R. Faas**, 15395 Washburn avenue, Detroit.

**Hoskins Manufacturing Company**, Detroit, has recently increased its capital stock to \$1,000,000. It is understood the additional funds will be used for expansion purposes.

**Detroit Aluminum and Brass Corporation**, Detroit, has increased its capital from \$250,000 to \$500,000.

The Michigan brass and bronze trade is interested in the new **Union Trust Building** that is now under construction at Griswold and Congress street, Detroit. Brass and bronze will be largely used in the production of valves for the piping system, for the exterior hardware on windows, for supports for gutters and conductors, and for many other purposes. The building will be thirty-two stories high.

The new plant of the **Peninsular Stove Company** in northwestern Detroit, on Burt road, now covers nine acres of a 20-acre site and is pronounced one of the finest structures for the manufacture of stoves to be found anywhere in Detroit. Its plating plant is the most up-to-date that money and brains could devise. The big plant is now completed and under full operation.

Owing to the general massiveness of the other industries in Detroit and their relation to the brass, copper and plating industries, it sometimes is forgotten that the motor city is also a center of the pin industry. Millions of the common little pins are manufactured here. One of the largest concerns of the kind, the **Crescent Brass and Pin Company**, came to Detroit way back in 1889 and has been manufacturing pins for the entire world ever since. Reaching the **Crescent** company's plant on Trumbull avenue as just ordinary brass wire, the raw

material passes through a series of intricate machines, many of them designed within the plant, and presently appears in the shipping room as pins, packed and ready to begin a journey to the consumer. At maximum production the Crescent plant is capable of turning out 250 tons of pins annually. It might be well to state at this point that Detroit-made pins are found wherever mankind has occasion to fasten one paper to another, adjust the height of a hem, or effect temporary repairs to wearing apparel. The pin industry as a rule continues busy practically all year.—F. J. H.

### Toledo, Ohio

April 2, 1928.

From an industrial standpoint, Toledo is one of the most favored manufacturing centers along the Great Lakes. Its industries are so varied that it always has something to fall back on when conditions are not very encouraging for a particular line. From the non-ferrous field at the present time come reports of increased activities and increased production. Favorable reports also come from the plating industries. Like other cities adjacent to Detroit, its plants are more or less engaged in the production of automobile equipment and accessories. At the same time, it manufactures complete motor cars also. All plants engaged in this work are now fairly well employed with prospects for continued activity for some time.—F. J. H.

### Cleveland, Ohio

April 2, 1928.

Like many other large manufacturing centers along the Great Lakes, Cleveland plants, particularly those engaged in the production of brass copper and aluminum products, are now showing indications of more extensive production. In some instances, it is stated, employment has increased fully 100 per cent; that means proportionately larger production. Much of this increased activity is traced to the automobile industry. Beginning of production by the Ford Motor Company and the increased output by the Chevrolet plant have sent thousands of new orders to Cleveland concerns engaged in the non-ferrous metal industry. Manufactured in Cleveland, these parts are transported to Detroit and other Michigan plants by motor trucks or by the lake route. The manufacture of plumbing supplies also is on the increase and the same report comes from various other concerns in the brass, copper and aluminum industry. The coming summer's production, while it may not equal the output of previous years, will be extensive and is likely to exceed that of a year ago.—F. J. H.

### Chicago, Ill.

April 2, 1928.

George P. Cullen has sold to the **Mechanical Plating Company** the one story building at 1522-26 West Austin Avenue, at a price of \$37,000. After extensive alterations are made the company will occupy the premises.

The **Crane Company** has negotiated with **James Wiggins** for a twenty-five year lease from May 1, 1928, on the premises it now occupies at 1224 Emerson Street, Evanston, Ill. In addition, it is taking twenty-four feet to the east. The premises are for the company's north shore branch.

The **Goetz Brass Company**, 630 North Franklin Street, manufacturers of bath, shower and lavatory fixtures, as well as special brass products, has been authorized to change its corporate name to **H. E. Robertson Company**. The new name was adopted due to a change in ownership. **H. E. Robertson** now being president and general manager. **A. H.**

**Green** is secretary-treasurer. The **Goetz** company was organized fifty years ago to engage in the manufacture of brewery equipment and fixtures. Prohibition resulted in a change to the **Goetz Brass Company**, which was acquired three years ago by the present owners.

New incorporations include: **National Metal Specialty Company**, capital, \$50,000; to manufacture and deal in metal specialties of all kinds; incorporators are, **Adolf Fallen, L. M. Newman** and **Maurice Washer**. **Electrol Company**; capitalized at \$2,000; to manufacture and deal in heaters, furnaces, burners, etc.; incorporators are, **A. J. Lindsay, W. T. Koken** and **G. P. Kuhl**. **Lawndale Scrap Iron and Metal Company**; capital, \$50,000; by **J. Fardy, William R. Skidmore** and **Esther Skidmore**; to deal in and manufacture iron, steel, copper, brass and zinc materials.—**A. P. N.**

### Milwaukee, Wis.

April 2, 1928.

Milwaukee metal industries are functioning with little indication of any slowing up and the employment situation as regards skillful labor is considered excellent here, it was reported here. A survey of forty-six factories manufacturing metal products for March shows an increase of 366 workers employed over March 1927. "I wish you would stress particularly that there is no place here for workmen who live out of the city. We have plenty of local labor unemployed, with the exception of skilled labor in metal trades," says **Harry Lippert**, superintendent of the public employment office of Milwaukee. Moulders, tool and die makers, machinists and automatic machine hands may find employment in Milwaukee, said Mr. Lippert, but in other fields there is not at present sufficient work to make it profitable for workers to come.

The **Racine Screw Company**, Racine, Wis., was burned to the ground in a fire that raged for almost twelve hours. The fire is believed to have started from spontaneous combustion. The oily floors and machinery were good fuel for the flames and the entire factory was destroyed. The loss suffered is not as yet known, but it will run to many thousands, it is said.

The **Muza Sheet Metal Company**, of Oshkosh, Wis., has been incorporated to manufacture and sell architectural and ornamental sheet metal, metal fronts, cornices and ceilings. The incorporators are **Francis Anderson, Norma Schuelke**, and **Augusta W. Ryall**.

Beginning March 15, 1928, the **West Bend Aluminum Company** of West Bend, Wis., will have four broadcastings each week over the radio station **WHT**, Wrigley Building, Chicago, these broadcastings to be continued for four weeks and possibly longer. The daytime talks will consist of specially prepared instructions and hints on cooking with the waterless cooker, and reference will also be made to the 250 other items of the **West Bend Aluminum Company's** line. The evening programs are playlets, entitled "Pa and Ma."

A revocation of the incorporation of the **Smalley** business at Manitowoc, Wis., by a committee of the creditors under the name of the **Smalley Corporation** gave information of the sale of the property to **W. R. Carr** of Anderson, Ind., including the filing of a new incorporation of the business under the old name, **The Smalley Corporation**, with a capital stock of \$50,000. The incorporators named are **F. J. Kerscher, John G. Kelley** and **Edna Braunel**. The re-incorporation of the **Smalley** business was not completed because of the sale of the property to **W. R. Carr**, who becomes identified with the new organization which is to continue to operate the local plant and to manufacture the **Smalley** line under the old patent rights. The company manufactures parts for machinery.

—**A. P. N.**

## Other Countries

### Birmingham, England

March 19, 1928.

Non-ferrous metals have been very much before the public during the past month because of the prominence given to them in the **British Industries Fairs** of London and Birmingham. London took charge of silver and electroplate, jewellery, watches and clocks, metal office furniture and a wide variety

of non-ferrous products. It is understood that very good sales were made at the London exhibition which was representative of the best products in the country. At Birmingham the exhibits were quite too numerous to mention. There were 900 exhibitors of all kinds of products, including aluminum ware (chiefly domestic), plumbers', water, sanitary and gas fittings, galvanized hollow-ware and every conceivable alloy in all sorts

of makes. Some very good orders were obtained and already the Chamber of Commerce, which is the controlling authority, has taken an extra 15 acres with the object of making large increases in space next year. Such new alloys as chromium and nickel were well represented and the white metal display was extremely good. The overseas visitors to the Show considerably exceeded 100,000. One of the features of the Birmingham Fair was the fine exhibition of new machinery, especially electrical furnaces for metal manufacture.

The non-ferrous trades generally have shown improvement. The **Admiralty Department** is at present enquiring for 11,000 stainless table knives with electroplated handles, and 1,000 carving knives, forks and steels for the officers' messes, with steel articles in proportion. Makers of galvanised hollow-ware have benefited by an improvement in trade, many tanks being needed for the packing of consignments for export.

Several branches of the brass trade in Birmingham are showing improvement. The continued activity of house building keeps up the demand for builders' brass fittings, and the revival in shipbuilding has brought out many orders. The most noticeable improvement is in shopfitting in which the factories are enjoying somewhat of a boom. In every large town the central shops are re-modelling their frontages with ornamental brass fittings. The amount of work is very much larger than usual. To some extent bronze and copper are being used for these renovations. **Gladwins Ltd.**, of Sheffield have obtained an order for 30,000 spoons and forks for use on liners and another order executed by the same firm is for 1,000 metal teapots for a firm of caterers. Keen competition is, however, being met with from Germany for electroplated spoons and forks.

There is evidence that the long delayed revival in the jewelry trade has commenced. Foreign business is improving, with South America a promising customer. The Birmingham manufacturers are making most of the cheap jewelry, in which they are meeting foreign competition very successfully. Canadian tea merchants are taking a lot of electroplated spoons and forks, presumably for advertising purposes. Tenders are being invited by the British Admiralty for best plated

hollow-ware, the items including 204 entree dishes, 84 waiters, 238 jugs and 7,000 spoons.

In hairdressing there is a reversion to the old-fashioned hairpin, now made largely in brass or other non-ferrous metal with a good deal of stone decoration, the turquoise being decidedly a favorite. The pinmakers have taken a share in the modern hair fashions, having produced what is called a grip pin very useful in the makeup of bobbed hair.

Great progress has been made in the substitution of copper tubes for lead in connection with domestic water conveyance. London has been the last to adopt this metal, but is now showing as much enthusiasm as other large centers.

The motor trades are busy and are absorbing a great deal of aluminum sheet, while increasing proportions of the machinery are made of the same metal, the demand for cylinders and cases being enormous. For domestic sanitary ware white metals are becoming more and more popular, but this is chiefly a British business, the higher price militating against foreign sales. India is a better market for nearly every form of non-ferrous production. Makers of non-ferrous tubes are very busy, especially for shipbuilding and the ever widening uses of tubes for all sorts of purposes is creating new demands. It is found that the tubes for a great many ornamental purposes can be very light and as copper is now quite moderate in price the adoption of the tubular form carries with it substantial economies.

Manufacturers of nickel have been assisted by the continual increase in demand for high qualities of steel. Wire-less manufacturers find an ever widening demand and electricity generally is consuming more and more copper and brass goods. The electrical branch of the Birmingham brass and copper trades promises to become a more important department of the non-ferrous trades. The electrical industries are among the most active and some very large contracts have been placed since the beginning of the year, all of which make good demands upon the non-ferrous trades. Copper scrap is becoming increasingly scarce but so far the price has not been much affected. There is a tendency, however, to utilize the virgin metals.—J. H.

## Business Items—Verified

**Safety Cable Company**, a division of the **General Cable Corporation**, formerly at 114 Liberty Street, New York, now has its offices at 420 Lexington Avenue.

**E. H. Hotchkiss Company**, Hoyt Street, Norwalk, Conn., manufacturer of snap fasteners and kindred metal goods, has awarded general contract for construction of a 1-story addition 50 x 132 ft., to cost close to \$95,000 with equipment.

**Club Aluminum Company**, Chicago, Ill., which has been reported as seeking to purchase a site in the vicinity of San Francisco for a Pacific Coast branch utensil manufacturing plant, states that it is not at present interested in the proposition.

**Crowe Name Plate and Manufacturing Company**, 1749 Grace Street, Chicago, Ill., is reported planning a 1-story addition to cost more than \$23,000. The company is not seeking any new equipment at present. It operates plating, grinding, lacquering and stamping rooms.

**Cutter Machine Company**, 3723 commonwealth Avenue, St. Louis, Mo., manufacturers of grinding and polishing lathes, have taken over the manufacture of grinding and polishing machinery formerly done by the **St. Louis Machine Tool Company**, the latter company having ceased manufacturing activities.

**Sangamo Electric Company**, Springfield, Ill., will build an addition 75 x 200 ft. in area, to cost \$75,000. The building will be used as a warehouse and no new equipment will be needed. This firm operates a tool room, and plating, japanning, stamping, soldering, polishing, lacquering and grinding departments.

**Electric Boat Company**, 11 Pine Street, New York, manufacturer of submarines, motor boats, etc., with plants at Croton, Conn., and Bayonne, N. J., is completing plans for merger with **New London Ship and Engine Company**, New

London, Conn., in which the electric Boat Company has heretofore held a substantial interest. The New London yard will be continued in operation.

**The A. V. Moore Brass Works, Inc.**, Norfolk, Va., has purchased 3½ acres of land and the old power station building on the East Camp property of the **Boush Creek Land Corporation** in the vicinity of Norfolk, where it will construct a large brass melting and refining plant. A building 87 x 200 ft. will be added to the 90 x 90 ft. power station which was built during the war and which is well suited for conversion into a brass plant. The company states all equipment has been purchased.

**E. Ingraham Company**, Bristol, Conn., has let a contract for construction of a one-story addition 25 x 161 ft., to be used as additional space for the company's press department. The firm, which manufactures clocks and mechanisms, plans to purchase no new equipment at this time, according to E. Ingraham, president. It operates a tool room, casting shop, plating, stamping, soldering, polishing and lacquering rooms.

**Philadelphia Metal Stamping Company**, the **Allied Metal Stamping Company**, the **William McIntosh Lithographing Company** and the **James A. MacMillan Chemical Company**, all occupying parts of a building Second and Erie Streets, Camden, N. J., suffered a combined loss of about \$200,000 when fire on February 23, 1928, destroyed a portion of the building.

**Allied Industrial Products Company**, Chicago, Ill., manufacturer of grinding wheels, buffing and polishing equipment, cleaners, etc., will build a 3-story and basement building to be devoted to the production of platers' supplies. A large amount of new equipment will be installed. Large stocks of supplies are to be stored in the basement. The necessity for new quarters has been occasioned by the company's pur-

chase of two other concerns, the **Peters Buff Company**, Wellston, Mass., and the **Chicago Buff and Wheel Company**, Chicago. In the past five years this company has had to increase its manufacturing facilities.

The **Brown Instrument Company**, Philadelphia, Pa., has increased its office space at the Detroit branch by removal to 576 Maccabee Building, Detroit, Mich. **R. W. Mayer** is district manager there.

The **Allington and Curtis Manufacturing Company** of Saginaw, Mich., was recently given a broad decision in its dust collector litigation against infringers, by the United States District Court for the eastern district of New York.

After May 1st, the New York Office of the **Maas and Waldstein Company** will be permanently located at 438 Riverside Avenue, Newark, N. J. The factory being located at this

point consolidates all departments. A new building now under construction will provide ample space for both the executive and factory offices.

**J. L. Mott Company, Inc.**, Trenton, N. J., which recently underwent certain corporate changes in connection with its merger with the **Laib Company**, Louisville, Ky., is now functioning smoothly, according to an announcement by **George H. Laib**, president. The company comprises the following subsidiaries: **Laib Company**, Louisville, Ky.; **The J. L. Mott Iron Works**, New York City; **The Columbia Sanitary Manufacturing Company**, Louisville, Ky.; **The Mott Southern Company**, Atlanta, Ga.; **The Mott Company of Pennsylvania**, Philadelphia, Pa.; these concerns all have extensive manufacturing plants for the production of brass, iron and pottery plumbing and sanitary ware and allied products.

## Review of the Wrought Metal Business

By **J. J. WHITEHEAD**,

President, **Whitehead Metal Products Company** of New York, Inc.

WRITTEN ESPECIALLY FOR THE METAL INDUSTRY

April 2, 1928.

The advance in prices of fabricated brass and copper materials which was made effective March 30 created a moderate buying movement. Up to that time a normal volume of business was being placed from day to day, quite in line with the average for the past several months. Certain mills reported that February and March shipments in total were the largest in any corresponding month for several years. This was due to extreme activity in one or two departments and normal operations in others. As a general rule, however, the mill records up to the end of March indicated a slight decrease in business, compared with the first quarter last year.

With the opening of spring building operations the demand for sheet copper has shown some signs of developing. It is expected that this year the trades in this line will exceed last year's by a considerable amount. Brass pipe sales are heavy for the same reason plus the fact that the use of brass pipe in plumbing work is becoming more and more popular.

Business in nickel and nickel copper alloys has been very good.

Nickel silver manufacturers have enjoyed a fair volume of trade and producers of monel metal have the largest tonnage on their order books in the history of the business. These orders are coming from a wide variety of industries, especially from the various manufacturers of equipment for the textile, hospital, hotel, restaurant, laundry and chemical fields.

The extremely satisfactory conditions of the monel metal and malleable nickel business can be attributed to a steady advertising campaign conducted through a large number of trade journals in the various fields to which the metals may be applied, plus the activities of the field forces in cooperating with the manufacturers of equipment in extending the use of the metals in new applications. Nickel is now specified by the State of New York for their steam jacketed kettles in all state institutions. One order placed recently for a large number of kettles consumed several tons of nickel sheets.

Taking into account the fact that nearly all fabricators of non-ferrous metals have been comfortably busy, the tide of general business conditions appears to be rising.

## Metal Market Review

By **R. J. HOUSTON**,

**D. Houston & Company, Metal Brokers, New York**

WRITTEN ESPECIALLY FOR THE METAL INDUSTRY

### Copper

April 2, 1928.

There were periods of activity and dullness in copper during March, and yet, when the results for the month were made up, it was demonstrated that the total transactions were exceedingly heavy and prices decidedly firmer than 30 days ago. Some metal was offered by custom smelters and outside holders at a shade under the regular market, but despite occasional concessions to 14 cents, the leading producers maintained a firm quotation of 14½ cents delivered Connecticut points. A stronger tone developed at the month-end, with pronounced activity for both domestic and export account. The home trade placed heavy orders at 14½ cents delivered Connecticut Valley for April and May shipment.

Purchasing for export was on a large scale. European consumers were consistent buyers week after week. The sales for export were made at 14½ cents c.i.f. European ports, and the total tonnage taken for foreign shipment played an important role in the market. Export buying of copper has been a factor of prime importance in the situation, and it reflects the notable dimensions of the foreign demand for copper. Aggregate sales during the month of March are estimated at 275,000,000 to 290,000,000 pounds, over half of this amount being for domestic delivery, and shipment being for March, April and May. Market closed firm at 14½c delivered Connecticut and 14½c Europe, with continued heavy buying for export, but quiet trade in the local market.

### Zinc

The zinc price shows some improvement as compared with a month ago, but current levels of 5.70c E. St. Louis and 6.05c New York is not particularly satisfactory to smelters. With a recent

asking price of \$40 per ton for ore prime Western should be in better position, it is claimed, but unless there is greater curtailment at mines the likelihood of a pronounced upward trend in the immediate future is not bright. Consuming demand was on a fair scale, but inquiries are not urgent enough to stimulate a great degree of market strength. Production of slab zinc in February amounted to 50,042 tons as against 52,414 tons in January. Domestic deliveries during February were 46,754 tons and exports 4,134 tons, making total shipments of 50,888 tons. The net result was a decrease of stocks in smelters' hands of 846 tons. Stocks in primary hands on March 1 amounted to 41,317 tons, and compared with 32,938 tons on March 1, 1927.

### Tin

Numerous cross currents in the tin situation gave the market alternate periods of strength and weakness. Conditions were very unsettled and depressed, especially in the first half of March, at which time Straits tin declined to 50 cents. Offerings at that figure, however, were absorbed and the market began to rally from that point. London was unsettled and for sometime entertained rather gloomy opinions regarding the outlook; but on receipt of better advices from this country the market abroad improved and prices showed an all round advance. Consumers bought freely on market declines. The situation in all markets continued sensitive as a logical consequence of speculative operations and prospects of increased production. The market for tin scored a substantial recovery recently, both at London and New York, with the domestic price of Straits tin at 53.55c to 53.80c for April and May delivery. Market steady.

## Lead

Domestic sales of lead were in large volume, particularly during the first part of the month, after the price was reduced to 6 cents New York. Deferred buying was stimulated by the more attractive price, and consumers bought in large quantities for prompt and nearby shipment. Many consuming lines participated in the buying movement, and a good degree of activity was in force up to the end of March. Eastern deliveries and shipments in Western territory are taking good care of the bulk of output, implying that consumption is on an excellent scale. It looks as if the low market level has been reached, for a while at least, and demand has no cause for hesitation on present outlook for business. Large requirements are in sight, and the market is shifting around in sellers' favor. April came in firm and the leading producers advanced the price to 6.10 cents New York basis, being the first official advance since March 1.

## Aluminum

Operations in the aluminum industry are on a large scale. There is a good demand for the domestic and imported metal, and, with increased automobile activity, large quantities of aluminum are going into manufacture. Other large users of aluminum are maintaining good consumption. Sales and shipments are good and there is no sign that they will fall off. Stocks of aluminum in bond on February 1 amounted to 12,101,923 pounds, as against 14,309,614 pounds on January 1. Shipments of German aluminum to the United States in 1927 showed a decrease to 2,073 metric tons compared with 8,179 tons in 1926.

## Antimony

A dull market for antimony and a restricted consuming demand were recent features. Prices have suffered on this account and easier conditions have developed owing to some pressure by sellers of nearby metal and a desire to liquidate stocks on hand. Consumers have inclined toward a hand-to-mouth policy in buying, and speculative dealers also show caution. The market at the end of March was quoted at 7½¢ c.i.f. New York for May and June arrivals. Spot Chinese regulus was 9½¢ to 9¾¢ duty paid. The stocks of antimony in U. S. bonded warehouses on February 1 amounted to 2,739,635 pounds, a reduction of 806,150 pounds from January 1, 1928.

## Quicksilver

A firmer tone has developed for quicksilver lately, with more active trading in the commodity. Fair sized orders were reported for prompt and future deliveries. Price quoted is \$124 per flask.

## Platinum

Refined platinum is quoted at \$76.50 per ounce. This compares with a price of \$87.00 an ounce in February. Output is said to be increasing in Soviet Russia, but it does not measure up to the level of 1913.

## Silver

Price trend in silver during the past month has been remarkably steady. China has been both seller and buyer. Good buying by India was a feature at one stage of the situation, but operations for Far East account have been conducted with considerable conservatism lately. Offerings, however, have also been comparatively reserved at prevailing quotations. This has tended to give needed support to a not over-buoyant market. Shanghai silver stocks on March 8 were reported at 111,800,000 taels, as against 107,800,000 taels on March 1.

Present quotation for silver bullion in New York is 57½ cents per ounce.

## Old Metals

General conditions in the market for copper and brass grades of old metal are firmer, owing to the improvement in the primary market. Buyers are willing to follow the upward trend for good graded material. Business in Middle West is in good volume due in considerable measure to the activity in automobile production. Consumers are more interested in the market, and a steady movement of supplies is expected during the next two to three months. A fairly good business was done for export in March, and renewed buying for foreign account is looked for in April. Recent quotations at which dealers were prepared to buy were 11¼¢ to 12¢ for crucible copper, 10¢ to 10¼¢ for light copper, 7¢ to 7¼¢ for heavy brass, 5¾¢ to 6¢ for light brass, 9¼¢ to 9½¢ for new brass clippings, 4¾¢ to 5¢ for heavy lead, 3¢ to 3¼¢ for old zinc, and 17½¢ to 18¢ for aluminum clippings.

## Daily Metal Prices for the Month of March, 1928

## Record of Daily, Highest, Lowest and Average Prices and the Customs Duties

	1	2	5	6	7	8	9	12	13	14	15	16	19
Copper c/lb. Duty Free													
Lake (Delivered)	14.20	14.20	14.25	14.25	14.25	14.25	14.25	14.25	14.25	14.25	14.20	14.20	14.20
Electrolytic (f. a. s. N. Y.)	14.15	14.15	14.20	14.30	14.30	14.30	14.30	14.30	14.30	14.30	14.30	14.25	14.30
Casting (f. o. b. N. Y.)	13.65	13.75	13.80	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.80	13.80	13.80
Zinc (f. o. b. St. L.) c/lb. Duty 1¼¢/lb.													
Prime Western	5.45	5.45	5.50	5.525	5.575	5.60	5.625	5.65	5.70	5.675	5.65	5.65	5.70
Brass Special	5.50	5.50	5.55	5.575	5.625	5.65	5.675	5.70	5.75	5.725	5.70	5.70	5.75
Tin (f. o. b. N. Y.) c/lb. Duty Free													
Straits	51.50	51.50	52.125	51.625	51.50	51.375	51.375	50.875	50.25	50.625	51.125	51.875	53.125
Pig 99%	50.875	51.00	51.625	51.125	51.00	51.00	50.375	49.625	49.75	50.25	51.00	52.125	52.125
Lead (f. o. b. St. L.) c/lb. Duty 2¼¢/lb.	5.75	5.75	5.75	5.825	5.90	5.95	5.95	5.825	5.825	5.825	5.825	5.825	5.80
Aluminum c/lb. Duty 5¢/lb.	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30
Nickel c/lb. Duty 3¢/lb.													
Ingot	35	35	35	35	35	35	35	35	35	35	35	35	35
Shot	36	36	36	36	36	36	36	36	36	36	36	36	36
Electrolytic	37	37	37	37	37	37	37	37	37	37	37	37	37
Antimony (J & Ch) c/lb. Duty 2¢/lb.	10.125	10.25	10.25	10.25	10.50	10.375	10.375	10.50	10.375	10.50	10.50	10.625	10.375
Silver c/oz. Troy Duty Free	57.125	57.00	57.125	57.125	57.25	57.125	57.125	57.375	57.25	57.25	57.25	57.375	57.50
Platinum \$/oz. Troy Duty Free	78	78	78	78	78	75	75	75	77	77	77	77	77
Copper c/lb. Duty Free	20	21	22	23	26	27	28	29	30	High	Low	Aver.	
Lake (Delivered)	14.20	14.20	14.125	14.125	14.25	14.25	14.25	14.25	14.30	14.30	14.125	14.225	
Electrolytic (f. a. s. N. Y.)	14.30	14.30	14.35	14.30	14.35	14.35	14.35	14.35	14.35	14.35	14.15	14.293	
Casting (f. o. b. N. Y.)	13.80	13.80	13.75	13.75	13.80	13.80	13.80	13.80	13.80	13.85	13.65	13.802	
Zinc (f. o. b. St. L.) c/lb. Duty 1¼¢/lb.													
Prime Western	5.70	5.675	5.70	5.725	5.725	5.70	5.70	5.70	5.70	5.725	5.45	5.640	
Brass Special	5.75	5.725	5.75	5.775	5.775	5.75	5.75	5.75	5.75	5.775	5.50	5.690	
Tin (f. o. b. N. Y.) c/lb. Duty Free													
Straits	52.125	53.875	53.50	53.75	53.00	52.875	53.00	53.125	53.875	53.875	50.25	52.182	
Pig 99%	51.50	53.00	52.75	53.375	52.625	52.50	52.75	52.75	53.375	53.375	49.625	51.608	
Lead (f. o. b. St. L.) c/lb. Duty 2¼¢/lb.	5.80	5.80	5.85	5.825	5.85	5.85	5.85	5.85	5.85	5.85	5.75	5.833	
Aluminum c/lb. Duty 5¢/lb.	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	24.30	
Nickel c/lb. Duty 3¢/lb.													
Ingot	35	35	35	35	35	35	35	35	35	35	35	35	
Shot	36	36	36	36	36	36	36	36	36	36	36	36	
Electrolytic	37	37	37	37	37	37	37	37	37	37	37	37	
Antimony (J & Ch) c/lb. Duty 2¢/lb.	10.125	10.00	9.875	10.00	10.00	9.75	9.75	9.75	9.75	10.625	9.75	10.182	
Silver c/oz. Troy Duty Free	57.375	57.25	57.50	57.375	57.25	57.125	57.25	57.25	57.25	57.50	57.00	57.25	
Platinum \$/oz. Troy Duty Free	77.00	77.00	76.50	76.50	76.50	76.50	76.50	76.50	76.50	78.00	75.00	76.795	

# Metal Prices, April 9, 1928

## NEW METALS

Copper: Lake, 14.30. Electrolytic, 14.25. Casting, 13.90.  
Zinc: Prime Western, 5.775. Brass Special, 5.825.  
Tin: Straits, 52.50. Pig, 99%, 51.70.  
Lead: 6.05. Aluminum, 24.30. Antimony, 9.625.

Nickel: Ingot, 35. Shot, 36. Elec. 37. Pellets, 40.  
Quicksilver: flask, 75 lbs. \$124. Bismuth, \$2.10.  
Cadmium, 75. Cobalt, 97%, \$2.60. Silver, oz., Troy, 57.125.  
Gold: oz., Troy, \$20.67. Platinum, oz., Troy, \$76.50.

## INGOT METALS AND ALLOYS

Brass Ingots, Yellow.....	10 to 11
Brass Ingots Red .....	12 to 13½
Bronze Ingots .....	12½ to 16
Casting Aluminum Alloys .....	21 to 24
Manganese Bronze Castings .....	23 to 40
Manganese Bronze Ingots .....	12½ to 16½
Manganese Bronze Forging .....	32 to 40
Manganese Copper, 30% .....	25 to 35
Monel Metal Shot .....	28
Monel Metal Blocks .....	28
Parsons Manganese Bronze Ingots .....	16½ to 19¾
Phosphor Bronze .....	14 to 15
Phosphor Copper, guaranteed 15% .....	18 to 21
Phosphor Copper, guaranteed 10% .....	17 to 20
Phosphor Tin, guaranteed 5% .....	75 to 80
Phosphor Tin, no guarantee .....	60 to 70
Silicon Copper, 10%....according to quantity....	28 to 32

## OLD METALS

Buying Prices		Selling Prices	
12¼ to 12¾	Heavy Cut Copper .....	13¾ to 14	
12 to 12½	Copper Wire .....	13 to 13¾	
10 to 10½	Light Copper .....	11¾ to 12¾	
10 to 10¼	Heavy Machine Composition .....	11 to 11½	
7¾ to 8	Heavy Brass .....	9¾ to 9½	
6½ to 6¾	Light Brass .....	8 to 8¼	
7¾ to 8	No. 1 Yellow Brass Turnings .....	9¾ to 9¼	
9¾ to 9½	No. 1 Composition Turnings .....	10¾ to 11	
5½ to 5¾	Heavy Lead .....	6¾ to 7	
3½ to 3¾	Zinc Scrap .....	4¾ to 5¼	
8 to 10	Scrap Aluminum Turnings .....	12½ to 14¼	
13 to 13½	Scrap Aluminum, cast alloyed .....	17½ to 18½	
19 to 20	Scrap Aluminum, sheet (new) .....	22 to 22½	
35 to 37	No. 1 Pewter .....	41½ to 43½	
11½	Old Nickel Anodes .....	13½	
17½	Old Nickel .....	19½	

## Wrought Metals and Alloys

### COPPER SHEET

Mill shipment (hot rolled) .....	23c. to 24c. net base
From Stock .....	24c. to 25c. net base

### BARE COPPER WIRE

16c. to 16¼c., net base, in carload lots.

### COPPER SEAMLESS TUBING

24½c. to 25½c. net base.

### SOLDERING COPPERS

300 lbs. and over in one order .....	21½c. net base
100 lbs. to 200 lbs. in one order .....	22c. net base

### ZINC SHEET

Duty sheet, 15% .....	Cents per lb.
Carload lots, standard sizes and gauges, at mill, less 8 per cent discount .....	8.50 net base
Casks, jobbers' price .....	9.00 net base
Open casks, jobbers' price .....	9.50 to 9.75 net base

### ALUMINUM SHEET AND COIL

Aluminum sheet, 18 ga., base price .....	33.30c.-36.50c.
Aluminum coils, 24 ga., base price .....	31.00c.

### ROLLED NICKEL SHEET AND ROD

#### Net Base Prices

Cold Drawn Rods.....	53c.	Cold Rolled Sheet.....	60c.
Hot Rolled Rods.....	45c.	Full Finished Sheet.....	52c.

### BLOCK TIN SHEET

Block Tin Sheet—18" wide or less. No. 26 B. & S. Gauge or thicker, 100 lbs. or more 10½c. over Pig Tin; 50 to 100 lbs., 15c. over; 25 to 50 lbs., 17c. over; less than 25 lbs., 25c. over.

### SILVER SHEET

Rolled sterling silver 58¼c. to 60¼c. per ounce, Troy.

### BRASS MATERIAL—MILL SHIPMENTS

In effect December 2, 1927

To customers who buy 5,000 lbs. or more in one order.

	Net base per lb.		
	High Brass	Low Brass	Bronze
Sheet .....	\$0.18¾	\$0.20¼	\$0.22¼
Wire .....	.19¼	.20¾	.22¾
Rod .....	.16½	.21	.23
Brazed tubing .....	.26¾	....	.32
Open seam tubing .....	.26¾	....	.32
Angles and channels .....	.29¾	....	.35

For less than 5,000 lbs. add 1c. per lb. to above prices.

### BRASS SEAMLESS TUBING

23½c. to 24½c. net base.

### TOBIN BRONZE AND MUNTZ METAL

Tobin Bronze Rod .....	20¾c. net base
Muntz or Yellow Metal Sheathing (14"x48") .....	18¾c. net base
Muntz or Yellow Rectangular sheet other Sheathing .....	19¾c. net base
Muntz or Yellow Metal Rod .....	16¾c. net base

Above are for 100 lbs. or more in one order

### NICKEL SILVER (NICKELENE)

#### Net Base Prices

Grade "A" Sheet Metal		Wire and Rod	
10% Quality .....	26½c.	10% Quality .....	29½c.
15% Quality .....	28 c.	15% Quality .....	33¼c.
18% Quality .....	29¼c.	18% Quality .....	36½c.

### MONEL METAL SHEET AND ROD

Hot Rolled Rods (base) 35	Full Finished Sheets (base) 42
Cold Drawn Rods (base) 40	Cold Rolled Sheets (base) 50

### BRITANNIA METAL SHEET

No. 1 Britannia—18" wide or less, No. 26 B. & S. Gauge or thicker, 500 lbs. or over, 8c. over N. Y. tin. price; 100 lbs. to 500 lbs., 10c. over; 50 to 100 lbs., 15c. over; 25 to 50 lbs., 20c. over; less than 25 lbs., 25c. over. Prices f. o. b. mill.

# Supply Prices, April 9, 1928

## ANODES

<b>Copper:</b> Cast .....	21 c. per lb.	<b>Nickel:</b> 90-92% .....	45c. per lb.
Rolled .....	19¾c. per lb.	95-97% .....	47c. per lb.
Electrolytic .....	18¾c. per lb.	99% .....	49c. per lb.
<b>Brass:</b> Cast .....	20 c. per lb.	<b>Silver:</b> Rolled silver anodes .999 fine are quoted from 60¼c.	
Rolled .....	19¾c. per lb.	to 62¼c., Troy ounce, depending upon quantity purchased.	
<b>Zinc:</b> Cast .....	12 c. per lb.		

## FELT POLISHING WHEELS WHITE SPANISH

Diameter	Thickness	Under 100 lbs.	100 to 200 lbs.	Over 200 lbs.
10-12-14 & 16"	1" to 3"	\$3.00/lb.	\$2.75/lb.	\$2.65/lb.
6-8 & over 16	1 to 3	3.10	2.85	2.75
6 to 24	Under ½	4.25	4.00	3.90
6 to 24	½ to 1	4.00	3.75	3.65
6 to 24	Over 3	3.40	3.15	3.05
4 up to 6	¼ to 3	4.85	4.85	4.85
4 up to 6	Over 3	5.25	5.25	5.25
Under 4	¼ to 3	5.45	5.45	5.45
Under 4	Over 3	5.85	5.85	5.85

Grey Mexican Wheel deduct 10c per lb. from White Spanish prices.

## COTTON BUFFS

Full Disc Open buffs, per 100 sections.	
12" 20 ply 64/68 Unbleached.....	\$30.35
14" 20 ply 64/68 Unbleached.....	39.05
12" 20 ply 80/92 Unbleached.....	31.85
14" 20 ply 80/92 Unbleached.....	43.20
12" 20 ply 84/92 Unbleached.....	42.50
14" 20 ply 84/92 Unbleached.....	57.60
12" 20 ply 80/84 Unbleached.....	38.35
14" 20 ply 80/84 Unbleached.....	52.00
Sewed Pieced Buffs, per lb., bleached.....	45-70

## CHEMICALS

These are manufacturers' quantity prices and based on delivery from New York City.

Acetone .....	lb.	.11-.17	Iron Sulphate (Copperas), bbl. ....	lb.	.01½
Acid—Boric (Boracic) Crystals .....	lb.	.12	Lead Acetate (Sugar of Lead) .....	lb.	.13¾
Chromic, 75 and 125 lb. drums.....	lb.	.24-.25	Yellow Oxide (Litharge) .....	lb.	.12½
Hydrochloric (Muriatic) Tech., 20°, Carboys.....	lb.	.02	Mercury Bichloride (Corrosive Sublimate).....	lb.	\$1.58
Hydrochloric, C. P., 20 deg., carboys.....	lb.	.06	Nickel—Carbonate, dry, bbls. ....	lb.	.29
Hydrofluoric, 30%, bbls.....	lb.	.08	Chloride, bbls. ....	lb.	.17-.18
Nitric, 36 deg., carboys.....	lb.	.06	Salts, single, 300 lb. bbls. ....	lb.	.10½
Nitric, 42 deg., carboys.....	lb.	.07	Salts, double, 425 lb. bbls. ....	lb.	.10
Sulphuric, 66 deg., carboys.....	lb.	.02	Paraffin .....	lb.	.05-.06
Alcohol—Butyl .....	lb.	.17½-.22¼	Phosphorus—Duty free, according to quantity.....	lb.	.35-.40
Denatured, bbls. ....	gal.	.47-.59	Potash, Caustic Electrolytic 88-92% broken, drums lb.	lb.	.09¾
Alum—Lump, Barrels .....	lb.	.03¾	Potassium Bichromate, casks (crystals) .....	lb.	.08½-.09
Powdered, Barrels .....	lb.	.042	Carbonate, 96-98% .....	lb.	.07-.07½
Aluminum sulphate, commercial tech.....	lb.	.02¾	Cyanide, 165 lb. cases, 94-96%.....	lb.	.57½
Aluminum chloride solution in carboys.....	lb.	.06½	Pumice, ground, bbls. ....	lb.	.02½
Ammonium—Sulphate, tech., bbls.....	lb.	.03¾	Quartz, powdered .....	ton	\$30.00
Sulphocyanide .....	lb.	.65	Rosin, bbls. ....	lb.	.04½
Arsenic, white, kegs .....	lb.	.05	Rouge, nickel, 100 lb. lots .....	lb.	.25
Asphaltum .....	gal.	.35	Silver and Gold .....	lb.	.65
Benzol, pure .....	gal.	.60	Sal Ammoniac (Ammonium Chloride) in casks.....	lb.	.05½
Borax Crystals (Sodium Biborate), bbls.....	lb.	.04½	Silver Chloride, dry, 100 oz. lots.....	oz.	.50½
Calcium Carbonate (Precipitated Chalk).....	lb.	.04	Cyanide (fluctuating) .....	oz.	.50¾-.60
Carbon Bisulphide, Drums .....	lb.	.06	Nitrate, 100 ounce lots .....	oz.	.39¼-.41½
Chrome Green, bbls. ....	lb.	.28	Soda Ash, 58%, bbls. ....	lb.	.02½
Chromic Sulphate .....	lb.	.37	Sodium—Cyanide, 96 to 98%, 100 lbs. ....	lb.	.19
Copper—Acetate (Verdigris) .....	lb.	.37	Hyposulphite, kegs .....	lb.	.04
Carbonate, bbls. ....	lb.	.16-.17	Nitrate, tech., bbls. ....	lb.	.04¾
Cyanide (100 lb. kegs).....	lb.	.50	Phosphate, tech., bbls. ....	lb.	.03¾
Sulphate, bbls. ....	lb.	.05¾	Silicate (Water Glass), bbls. ....	lb.	.02
Cream of Tartar Crystals (Potassium Bitartrate) lb.	lb.	.27	Sulpho Cyanide .....	lb.	.42½-.45
Crocus .....	lb.	.15	Sulphur (Brimstone), bbls. ....	lb.	.02
Dextrin .....	lb.	.05-.08	Tin Chloride, 100 lb. kegs .....	lb.	.39½-.40½
Emery Flour .....	lb.	.06	Tripoli, Powdered .....	lb.	.03
Flint, powdered .....	ton	\$30.00	Wax—Bees, white, ref. bleached.....	lb.	.60
Fluor-spar (Calcic fluoride) .....	ton	\$75.00	Yellow, No. 1.....	lb.	.45
Fusel Oil .....	gal.	\$4.45	Whiting, Bolted .....	lb.	.02½-.06
Gold Chloride .....	oz.	\$14.00	Zinc, Carbonate, bbls. ....	lb.	.11-.12
Gum—Sandarac .....	lb.	.26	Chloride, casks .....	lb.	.06¾
Shellac .....	lb.	.59-.61	Cyanide (100 lb. kegs) .....	lb.	.41
			Sulphate, bbls. ....	lb.	.03¾